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TOJDEL is confident that readers will learn and get different aspects on distance education and e-learning. Any views expressed in this publication are the views of the authors and are not the views of the Editor and TOJDEL.

TOJDEL thanks and appreciate all reviewers who have acted as reviewers for one or more submissions of this issue for their valuable contributions.

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CURRENT TRENDS OF MOOCS IN INDIA: HISTORICAL BACKGROUND, DEVELOPMENT AND CHALLENGES

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ABSTRACT:

This article investigates the many variables that impact the adoption of Massive Open Online Courses (MOOCs) in the Indian higher education sector. A MOOC is similar to a tool for offering educational materials via an online platform to a sizable number of students around the world with the potential of receiving education from the best schools. In 2008, MOOCs were established and attained momentum in 2012 as a popular learning tool (Biswas & Sarkar, 2020). At present, the enrolment of students in MOOCs has grown tremendously. After the USA, India is leading the universal outgrowth in student engagement (Reddy, 2020). Observing the enhancement of enrolment in the higher education sector and also fulfilling the demands of the students, India has launched different project programme for offering MOOC courses in Higher education. At present, platforms such as NPTEL (2003), mookIT (2014), IITBombayX (2016), and SWAYAM are used in India to offer MOOC courses (2016). MOOCs have played a major role in increasing the Gross Enrolment Ratio in the field of Higher Education (Banwari, 2018). A key issue that Indian higher education is currently grappling with is the lack of coordination and its application to various economic sectors. However, these problems are eradicated by the MOOC programme because maximum courses of the MOOCs are related to industry demand and needs. In this article, conceptual and technical descriptions of different MOOC platforms are provided along with their components and features. The present study also attempts to explain why MOOCs are so necessary in countries like India and what are the benefits and challenges for the implementation of MOOCs. MOOCs in countries like India provide lifelong opportunities to learn and work together. In a large nation such as India, MOOCs promote the idea of inclusive, lifelong learning.

Keywords: MOOCs, Indian MOOCs platform, challenges

1. Introduction:

Massive Open Online Courses (MOOCs) Over the past few years, MOOCs have generated significant buzz in the higher education sector and much debate among students, teachers, educationists, higher education institutions, civil society, government, policymakers, and private organizations.

In this 21st-century digital era, it has been observed that most countries around the globe are supporting more and more online, virtual initiatives in the sphere of education. Numerous studies have examined the use of online learning throughout the world, and it has been shown that developed nations, where more than 70% of education is given online, use online learning more frequently than other regions. However, because it is a field that is only accessible to a tiny segment of a developed population in a country like India, the practical implementation or usefulness of many online courses such as MOOCs is not as widespread and successful even in the current situation. However, rural areas in India have experienced the greatest population expansion, and residents there lack the resources to attend high-quality education. From these perspectives, MOOC courses play a leading role in providing a cost-effective way of learning. The most beneficial aspect of MOOCs is that different kinds of courses offered by top universities and professors are available. There are also facilities of MOOCs, such as free access to lectures and contents and access to courses in diverse areas for diverse people. Because there are no drawn-out procedures, formalities, or prerequisites for enrolment in a course, MOOCs are learner-friendly. The demands for MOOC came along with the digital era. The University Grant Commission (UGC) took the initiative to promote the CBCS system and credit transfer, so the Indian higher education sector has been mandated by UGC to deliver 20% of courses through MOOCs (Bordoloi et al., 2020). Additionally, MOOCs have several limitations; for example, a teacher's physical attributes and the experience of a true classroom learning setting cannot be replaced.

2. Objectives of the study:

The following goals are being attempted to be met this study:

1. To study the basic conception and features of MOOC programmes in India.

2. To study the history and development of MOOCs programmes in India.
3. To identify the challenges and problems in executing MOOC programmes in India.
4. To study the advantages and disadvantages of MOOC courses.

3. Significance of the study:

From the different studies, reviews, and discussions in the literature, the researcher finds that the rising population growth, insufficient teaching-learning materials, deficiency of infrastructure, scarcity of teachers, educational institutions, and other necessary resources has constantly created hindrances in the path of yielding knowledge in a country like India. MOOCs are one of the vital tools to support open learning for such learners who need to remain outside of formal classroom teaching. The most remarkable recent example revealed by the (UNESCO) that over 800 million learners from around the world have been affected during COVID-19 (*CoronaVirus: Don't Let Our Children Down!*, 2020) and in India, over 286 million students from pre-primary to higher secondary school have been out since March 2020 (The Economic Times, 2020).

With this background, this study's primary objectives are to determine the various components influencing the successful implementation of quality, affordable MOOC programmes. This study also attempts to identify the various barriers and challenges faced while using MOOCs among students of different Indian universities.

4. Methodology:

A methodical approach to solving a research problem is known as research methodology. The term "methodology" refers to a trustworthy and dependable process for gathering and analyzing data to obtain knowledge (McMillian & Schumacher, 1989). For writing this paper and collecting the data, a review of related studies and content analysis was used. The author uses a qualitative method of literature study. Information's that is necessary is gathered from a variety of secondary sources, including articles, books, journals theses, different official websites of the government, and MOOC platforms like SWAYAM, NPTEL, mooKIT, IITBX, etc. The researcher also analyzed various literature reviews related to MOOCs published by several academicians, scholars, and researchers to gain a better understanding of the concept.

5. Introduction to MOOCs: Definition and Characteristics

Since the MOOC programme began in 2008, there have been many variations and definitions. Massive open online courses (MOOCs) are flexible, open, self-restrained, and designed for widespread involvement in online learning. One term or phrase associated with inclusive online learning styles is "MOOCs."

"An online course designed for open access and limitless participation via the web is known as a MOOC" (Kaplan & Haenlein, 2016).

When a course is developed for a large number of students, it is called a MOOC. These courses are accessible to anybody, anywhere, at any time, provided they have access to the internet, and there are no prerequisites for entrance qualifications. They also offer entire course knowledge online without any fee cost (*Definition Massive Open Online courses (MOOCs)*, 2015).

The completion rates are low for a whole MOOC course due to dissimilar motivations for enrolling in the MOOC. Even though accession to the course materials is free, MOOC platforms sometimes grant certificates for completing a course instead at a cost (Ansrsource, 2022). MOOC are such platforms that provide recognized institutions with cloud-based hosting environments for offering course content.

To analyze these definitions some Common meanings, emerge for the elements of MOOC:

- **Massive:** It is an online distance course developed for a huge number of participants. This means the number of learners must be larger than that of normal classroom participants or traditional campus-based classrooms.
- **Open:** Open means admitted to the course by anyone, anywhere, without fees and there is no mandatory qualification or required minimal qualification. In broad terms, open means freedom of time, place, and pace.
- **Online:** The total course content is delivered through the internet or web-based.
- **Course:** Course offers a complete learning experience or unit of study through a structured form. Full course including a set of education goals and objectives, defined subject fields, course materials, tasks, activities, assessment, feedback, examination, and certificate/degree of completion.

➤ Features of MOOCs platforms:

- It is mostly used in the non-formal system of education.
- MOOCs are used in both PDP and degree-oriented academic Programmes.

- It used an online platform to develop and operate the program.
- MOOC courses should be delivered in both synchronous and asynchronous modes.
- E-tutorial- (it's including Audio-video lessons, simulations, animations, etc.)
- E-content – (E-books, pdf, OER, Case studies, articles, presentations, etc.)
- Discussion forum (it means real-time discussion between the learners and the course coordinators)
- Assessment (MCQs questions, Quizzes, short and long answer-based questions)

6. Historical Background and perspective for the Development of MOOCs:

MOOC is the usual evolution of Open Course Ware, first made by the Massachusetts Institute of Technology (MIT) in 2001. Therefore, MIT is also leading the improvement of MOOCs, first with MITx, and then with the help of edX. Dave Cormier first suggested MOOCs in 2008 to characterize the course "Connectivism and Connective knowledge" by Siemens and Downes (*A Brief History of MOOCs*, n.d). Modern online course efforts by organizations people, and private and professional organizations commonly go by the name of MOOCs.

The Indian administration has also undertaken several steps to flourish the idea of online open distance learning. Initially, the government arranged some open resources for everybody in terms of online repositories, e-libraries, e-content, e-books, educational media files, etc.

The governance of India launched the "Study Webs of Active Learning for Young Aspiring Minds" project after realising how important it was for nation like India to deliver high-quality educational resources and programmes across the country. For distance learning online courses, SWAYAM provides a platform and website that are interconnected through the support of information and communication technology (ICT). SWAYAM also includes all higher education courses, skill-based courses, and upper secondary education to guarantee that every student gains something from using online e-learning resources.

Features of SWAYAM:

1. SWAYAM is an interactive e-content platform for mobile devices that can be used for courses from high school to college.
2. It is one kind of art of educational system that offer to easy access, monitoring, and certification.
3. It could very provide a good quality teaching-learning environment using multimedia resources on every time, everywhere basis.
4. It is also a platform for whole-group collaboration, interaction and discussion forums to light up suspicion.
5. It is one kind of hybrid model of delivering the quality-based content in a classroom teaching-learning environment.

In this situation, SWAYAM has taken the responsibility for the improvement and development of MOOCs courses with compliant technology-based content (likes audio-video, picture, and text) and setting up a large-scale based IT learning platform. The National Mission on Education through Information Communication Technology (NME-ICT) Programs includes the MOOC initiative. Under NME-ICT, NPTEL, one of the MOOC course platforms, promoted online subjects content centred around 23 disciplines and 933 courses. NPTEL is made up of 7 IITs and IISc (Lazarus & Suryasen, 2022).

Now we can understand the successive improvement and progress of the MOOCs for the SWAYAM platform, adhering to rules that mention the technical and standard production of e-content and resources for MOOCs courses.

- a) MOOCs are online courses created in accordance with the direction criteria for the next four quadrants:
- b) "Four quadrants approach": The four-quadrant method often takes into account an e-learning method that includes the following elements:
 - **First-Quadrant is an e-Tutorial:** It should include simulations, animation-based content, video demos, a virtual lab, and other things.
 - **The Second-Quadrant is e-Content:** Which should include interactive simulations where necessary, PDF content, text, e-books, graphics, and video presentations.
 - **The Third-Quadrant is Web Resources:** It should include related links, Wikipedia resources, case studies, open-source internet resources, books (together with e-books), research papers and journals, anecdotal record report, articles, and the historical growth of the subject.
 - **The Fourth-Quadrant is Self-Assessment:** This quadrant should consist of problems and resolution, it should be in various forms like Multiple Choice Questions, fill in the blanks, Matching Questions, Short Answer Questions, Long Answer Questions, Quizzes, Homework, Assignments and solutions, Discussion forum topics and setting up the FAQs, and rectification of common misconceptions.

SWAYAM has selected 9 national coordinators to ensure that the highest quality instruction and content are created and delivered. This are-

Table-1: Nationwide MOOCs Coordinators Authority:

S.NO	Nationwide MOOCs Coordinator	Sectors
1	AICTE (All India Council for Technical Education)	It is an international course that is self-paced.
2	University Grants Commission (UGC)	Master degree programmes offered (Non – Technology category)
3	NPTEL-National Programme on Technology Enhanced Learning	Offers Under-Graduate and Post-Graduate degree programmes that are technological or engineering-based.
4	Consortium for Educational Communication (CEC)	Non-technology degree courses are offered as part of the graduation degree programme.
5	IGNOU	IGNOU courses for certificates and diplomas.
6	CBSE NCERT	Class 9-12 of the School Educational Programs are available.
7	NIOS (National Institute of Open Schooling)	Open education or out-of-school educational programmes for students in grades 9 to12 standard.
8	IIM Bangalore	Management education
9	NITTR-National Institute of Technical Teachers Training and Research in Chennai	Teacher training program.

Source: (MOOCs Massive Open Online Courses An initiative under National Mission on Education through Information Communication Technology (NME-ICT) Programme, 2015).

7. Historical Development & Features of different types of MOOCs platforms in India:

The government of India launched a plethora of activities every day to strengthen and promote the idea of open education. The Indian government initially took the initiative to make all types of open resources, including digital libraries, repositories, and educational media assets such as audio, video, journals, articles, e-books, etc., available to the public. At present, there are so many efforts taken in this direction starting with various free online platforms such as the National Digital Repository of IGNOU, DIKSHA, e-pathshala, NISHTHA, e-gyankosh, NROER (National Repository of Open Educational Resources), SAKSHAT (platform for all educational news), E-Shodhsindhu (collection of e-journals), e-Yantra (Lab for the experiment), etc. Online education has gained popularity, and India began to develop it. Therefore, the government of India set up online course platforms such as MOOCs to offer free online courses. NPTEL, SWAYAM, mooKIT offered by IIT Kanpur, and IITBX offered by IIT Bombay are the major MOOC programmes that are now offering online education. Some of these organizations' works and efforts are briefly discussed below-

1. NPTEL

In India, NPTEL was first launched by MHRD in 2003. The Indian Institute of Science (IISc) and the Indian Institutes of Technology (IITs) are joint initiatives to offer online MOOC courses through this platform for the engineering and science stream free of cost. At present, NPTEL has started various types of courses for different streams such as mechanical, electrical, management, ocean engineering, computer science, humanities, and music. Currently, it offers 2400+ courses and total enrolments of more than 1.82 crores (NPTEL, n.d.). NPTEL has delivered its courses through open-source technology. The classes are run on Google's open-source course

Builder platform, which also hosts App Engine and Compute Engine. The majority of NPTEL's course materials are presented primarily through video lectures created in a traditional classroom setting.

2. mookIT

In 2014, the Indian Institute of Technology at Kanpur (IITK) created mookIT, a scaled-down version of the MOOC management system that also used open-source technology. This system is reliable and capable of providing online courses at many levels, from micro to macro. It was created specifically as a platform for connectivist MOOCs (cMOOC). More than 200,000 people have registered for its 200+ courses that are currently being offered (*mookIT*, n.d.). Because mookIT offers an audio stream with play sync slides that is extremely comparable to the video experience, it is especially useful for students who live in remote rustic areas not having smartphone, laptop, computer, high bandwidth, or reliable internet service. Learners only need a basic phone to receive a phone call and listen to audio.

3. IITBX

IIT Bombay developed the non-profit MOOC platform IITBX in 2014 using the open-source Open edX technology. The Government of India's MHRD was responsible for its conception, development, and funding through National Mission on Education through Information and Communication Technology (NME-ICT). The goals and objectives of IITBX are to spread high-quality education wherever there is internet access and to improve and increase access to education for students who are dispersed over rural and far-flung places. At present IITBX have offers 200 courses on different subject domains. Each of these courses is categorized into four learning areas: EduMOOCs, LifeMOOCs, SkillMOOCs, and TeachMOOCs for various learning needs (*IITBombayX*, n.d.).

4. SWAYAM

Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) is an acronym. The government of India's Minister of Human Resource Development (MHRD) unveiled SWAYAM, the country's national MOOC platform. SWAYAM's major goal is to make the better teaching and learning materials available to everyone, even the most least fortunate students. It was initially decided to start more than 2000 courses, which made it the largest course provider among all the providers at that time (*Swayam Central*, n.d.). For those students who have up until now been untouched by the digital revolution and are incapable of taking part in the mainstream acquisition of wisdom for the economy, SWAYAM aims to bridge the digital divide.

▪ Other majors MOOCs platforms: -

- **Coursera:** This is a type of profit-making company that was established by two Stanford University computer science professors. More than 5800 courses, professional certificates, and degrees from renowned institutions are available there (*Coursera*, n.d.).
- **Udacity:** Additionally, a professor of computer science from Stanford University launched this platform for profit business. It aids in developing competences for in-demand skills with the most cutting-edge tech organizations worldwide and is instructed by outstanding industry leaders. Over 160,000 students in more than 240 countries enrolled in this platform and distributed 205k nanodegree certificates, and 73% graduate students consented that it was a favorable career change platform (*Udacity*, n.d.).
- **Khan Academy:** Salman Khan, a graduate of MIT and Harvard, founded the non-profit company (Kaur, 2019). The goal is to offer world-class education at no cost of everyone, everywhere. Students can practice and learn at their own pace.
- **Udemy:** It is a for-profit platform. Through this platform, students learn at their own pace, with lifetime access on mobile and desktop devices. Here students also learn in-demand skills with over 213,000 video courses, and chose courses taught by real-world experts. In this platform in total 830 million enrollments and students enrolled were 62 million and more than 180+ countries membership and it can offer 75+ languages for the users (*Udemy*, n.d.).
- **WizIQ (India and USA):** IIT Delhi, India provides a wide variety of courses through this platform, all of which initially require registration and a price deposit to enroll (Kaur, 2019).

Table-2: Historical Development of Indian MOOCs Platforms

MOOCs Platform	Opening Year	Institution behind launch	Official URL of a Website
NPTEL	2003	IIT-Madras	npTEL.ac.in/
mookIT	2012	IIT-Kanpur	www.mookit.co/
IITBX	2014	IIT-Bombay	iitbombayx.in/
SWAYAM	2016	MHRD & Microsoft	swayam.gov.in

Source: Sources are taken from the above given website Link

Table-3: Feature& Comparison of Major MOOC’s platform providers in India

MOOCs Platform	Learning Mode	Course Format	Total Number of Courses	Total Number of users	Regulatory Credits	System Language	Mobile Application
NPTTEL	Online	Scheduled, Self-paced	2400+	1.82 crore	Partial/ Half	English	Yes
mooKIT	Blended	Scheduled	200+	2 Lakh	Half	English, Hindi, French, Russian, Ukrainian	No
IITBX	Online	Scheduled, Self-paced	200	1.25 million	Half	English	No
SWAYAM	Blended	Scheduled, Self-paced	2150+	2.72+crore	Full credit	English, Hindi	Yes

Source: Sources are taken from the above given website Link

8. Challenges to Successful Implementation of MOOCs Programs in India

The accessibility, usability, and quality of MOOCs programmes in India have grown remarkably in the recent few years. However, there are still many barriers in the way of MOOCs being successfully implemented in India. Some major current problems and challenges are discussed here.

1) Lack of Awareness among students about the MOOC courses-

The MOOC programme is not new in India; it started many years ago in 2003, but still, the awareness and popularity among the students are significantly low regarding the MOOC courses and their benefits (Devi, 2019). Shaikh (2017) study on the knowledge of student-teachers about MOOCs reveals that awareness of MOOCs among students is relatively low, even when students have negative impressions of MOOCs.

2) Lack of engagement in the real workplace-

It was observed that maximum MOOC platforms could not provide the opportunity for MOOC candidates to enter the actual workplace so that they can expose themselves to new fields or training in specific skills, often in emerging industries.

3) Lack of proper credit for MOOC certificate-

From the beginning, MOOC platform providers only offer a learning pathway of certification, which is not akin to university credits. As a result, the current trend for students to showcase their MOOC certificate only in personal job interviews, job portals, CVs, and personal profiles (LinkedIn, e-portfolio) is obvious.

4) High cost of MOOC production-

There is no sustainable economic model to offset all the costs incurred in MOOC creation, and MOOCs have high and variable attendance cost. The production and delivery of MOOCs involves several significant cost areas, including staff and faculty, administrators, instructional support staff, various types of content development, high-quality videography, photography, virtual labs, simulation, gamification, delivery platforms, and technical support. As a result, some MOOC providers received payments, and gradually increased their course costs, and as a result, students lost interest in MOOC courses.

5) Not address the diverse needs of students-

People in India, a secular and heterogeneous nation, come from various multicultural and multilingual families. There are hundreds of regional languages in India in addition to the 22 official main languages. Therefore, it was exceedingly challenging for MOOC organizers to create the content and provide the courses in such a wide range of languages (Chauhan, 2017). The NEP 2020 initiative emphasizes the importance of developing and delivering technical and vocational education in multiple languages.

6) Insufficient digital infrastructure-

A high-speed internet connection and digital materials, especially online platforms like MOOCs, are essential for any kind of online learning student. They will need a few basic items, such as a smartphone, computer, tablet, and a high-speed internet connection to attend MOOC courses. But in developing countries like India, maximum learners cannot afford all of these because they belong to economically poor families.

7) Gender gap and low enrolment in MOOC courses-

It was noted that there are a great number of failing courses in a nation like India due to the extremely low enrollment ratio and other common causes, such as a lack of digital marketing and advertising (Devi, 2019). The issue also applies to MOOC courses. Gender imbalance in enrollment presents another difficulty for MOOC courses. According to Bayeck (2016), women candidates enroll at higher rates when collaborative/group courses are available.

8) Ensuring the content overall quality of MOOCs-

Across the world, the vital concern and issue is the quality of MOOC courses and their content. For developing MOOC courses, the foremost necessary thing is highly qualified and skilled teachers/instructors along with high-quality resources. However, in India, there is always a shortage of these components. Even in NEP 2020, several recommendations and suggestions are given for identifying these issues. Such as adopting the credit transfer mechanism, enhancing continuous teacher training programmes and promoting MOOCs (Sharma & J.C, 2022).

9) Advantages and disadvantages of MOOCs in India:

MOOCs have the power to change barriers in the path of Indian higher education. Gradually, university enrolment is growing because of the discovery of some open and distance online-based platforms, where students can study at any time at their own pace free of cost or a minimal fee. From this perspective, digital technology-based platforms such as MOOCs could help so much. Here, we discuss some advantages and disadvantages of MOOCs.

Advantages of MOOCs:

Some advantages of MOOC courses are as follows:

- Most MOOC courses have free or nearly free access to the content and lectures.
- For MOOCs, courses do not require physical infrastructure.
- Opportunities to offer diverse courses from top universities and outstanding professors are available.
- Students can study from anywhere, at any time because everything is available online.
- Through an online mode environment, students fearlessly share their thoughts with others.
- Available MOOC courses in diverse areas for a diverse audience.
- In the MOOC platform, learners can invest and think for as long as they wish before sharing something.
- It allows students to work as a team and create group communication through an online platform.
- In these courses, the availability of faculty members or instructors is much higher even after the class than in traditional learning.
- Students can review and revise lectures immediately.
- MOOCs can create opportunities for global students to bring people together.

Disadvantages of MOOCs:

Some disadvantages of MOOCs courses are as follows:

- MOOCs cannot provide personalized content and personal attention by the instructor.
- MOOCs cannot offer the real physical classroom environment and physical appearance of a teacher.
- Language is one of the biggest barriers to MOOC courses. Because maximum courses are offered by the MOOCs in the English language. Hence, every kind of learner could not engage in MOOC courses.
- The total contents of MOOC courses are delivered through online mode, so it is necessary to have an internet connection. However, in India, the internet connection in remote areas is very poor, so it is a big barrier for MOOC courses.
- MOOCs are completely web-based courses, so there is a chance of plagiarism because students' activity also not monitoring.
- Interaction between students and teachers is crucial for the entire development of personality and behavior but there is little opportunity for this in MOOC courses.

9. Conclusion

India is one of the nations where online distance learning is becoming increasingly popular, using a variety of online platforms, one of which is the MOOCs platform. MOOCs are so famous for learners because they are open to everyone, offer free online courses, free access, minimum necessary qualification, quality faculty, and are affordable and fixable ways to learn new skills. For a variety of learning-related purposes, including career development, skill and professional development, changing careers, alternative learning, lifelong learning, self-paced distance learning, interactive e-Learning and training, millions of people in India have recently turned to MOOCs. In a country like India, the majority of citizens reside in remote rural areas that do not have proper platforms to access skills enhancement training and other quality learning. From this perspective, MOOCs can

play a pivotal role. However, numerous difficulties, complications, and difficulties are encountered when implementing MOOCs in India. The study mentions these difficulties and problems. MOOCs are large, open, and usually free, and they solve two important issues with contemporary education: accessibility and cost. Thus, MOOCs pose a serious threat to traditional higher education in India. The fact that MOOC dropout rates are high because various MOOC students have different goals makes assessing their progress difficult. While some just want to learn something, others want to finish the course. It is a failure for MOOCs. With open enrolment at no cost and essentially no deadlines, MOOC completion rates will always be lower—possibly much lower. Nevertheless, MOOCs can significantly contribute to student empowerment and the accessibility and affordability of education. To live up to this promise, MOOCs need to do more than deliver excellent lectures.

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IMPLEMENTATION OF MOOCs: APPROACHING CHALLENGES AND PROSPECTS OF INDIAN HIGHER EDUCATION

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ABSTRACT:

Learning must be considered a milestone to generate a knowledgeable and progressive society. The continuous up-gradation of knowledge and acquiring relevant skills to get livelihood opportunities can only be possible through learning. To ensure a sustainable and advanced civilisation in the 21st century industrial and digital setup, people are earnestly and ardently, owing to their belief in 'earning while learning,' looking for a global form of learning. In this context, different types of online courses, particularly MOOCs and OERs (Open Educational Resources), provide people with innumerable opportunities by introducing them to a global form of learning.

Keywords: Digital knowledge, e-learning, MOOCs, OERs, Skills, India.

Introduction:

Previously considered a bastion of tradition, education has, of late, through the incorporation of digital technology, experienced dramatic changes. Higher educational institutions, as we know, provide an individual with knowledge and skills and also promote the concept that learning is a life-long process. The rapid development of ICTs has greatly influenced higher educational institutions. To introduce the skills of learning observed in modern scientific research, ICT has contributed to creating new technological tools like MOOCs so that learners can gain a foothold in the competitive world. MOOC's (massive, open, online courses) introduction is one of those changes that strives to offer a comprehensive educational format. Dave Cormier coined the term MOOC in 2008 from the University of Manitoba. Several organisations, such as Coursera, Udacity, and edX (Pappano, 2012), introduced significant developing trends in education offered by MOOCs.

A MOOC, defined by McAuley et al., is "an online course with the option of free and open registration, a publicly shared curriculum, and open-ended outcomes. MOOCs integrate social networking, accessible online resources, and are facilitated by leading practitioners in the field of study" (McAuley et al., 2010, p. 10). Also, this new openness movement in education is a real game-changer that can widen access to lifelong learning, address key gaps in skill development and finally enhance the quality of life for millions (Daniel, 2012, p. 18). MOOCs are nothing but online courses open to be accessed from anywhere, at any time, with unrestricted participation from across the planet. Students, through MOOCs, are benefitted in terms of learning and communication. Bridging the gap for off-site learners, MOOCs also play the role of a catalyst between institutions, educators and learners. With the help of MOOCs, educators can plan, build, and implement online courses and design curricula that match international standards. MOOCs also provide a platform for faculty members for their professional development and academic growth.

The average Gross Enrolment Ratio (GER) for higher education across Asia is 30%. However, Asian countries differ in their performance. For example, in tertiary education, China shows more than 39% GER, India has 23%, while Bangladesh amounts only to 13%. A country like Korea has more than 95% GER, while Afghanistan, a low-middle-income country, shows only 9% GER (UNDP, India, 2016). In addition, more than 70% of uncounted and unrecognised women working for their daily living in some developing Asian countries are engaged in unorganised sectors (Ministry of Finance, Govt. of India, 2016). For Asian countries, this poses a big challenge, requiring an urgent need to mitigate the situation. For the future growth of their national income, the developing countries in Asia can transform themselves into major economies with an abundance of knowledgeable, skilled and trained human resources.

MOOCs, with the majority of Indian students enrolling in foreign universities, are witnessing a considerable demand among learners. One can hardly resist the offer of getting courses free of cost by some elite colleges. Coursera, for example, can be said to be a major player in the field, getting the second-highest enrolments from India. MOOC's growth can address the issues regarding increasing demand for higher education, and that too in developing countries where the building of enough traditional institutions to cope with the number of prospective students is almost impossible. However, MOOCs in India have the potential to fill the growing inequality gap in literacy and reduce unemployment among youths. Indian national institutes like IIMs and IITs also have begun

MOOCs. The Government of India, through SWAYAM, has also introduced 250 online courses (Ministry of Finance, Govt. of India, 2017-18). To validate and recognise the online courses' accomplishments from Coursera, edX, SWAYAM, UGC and other online educational institutions, the creation of a solid systematic structure by establishing a cooperative network among several institutions is the need of the hour.

The objective of the Study:

Considering the present age of industry and technology, the study tries to understand the needs and importance of MOOCs' introduction and implementation as an alternative platform in India to achieve the goal of a cost-effective Higher Education mobilisation. Going through the historical background of Indian MOOCs, it tries to analyse the current status, identify the challenges, and highlight the prospects of introducing MOOCs in the Indian higher education system.

Scope of the Study:

The main focus of the study revolves around providing genuine and authentic information to learners, parents, educators, and policymakers to reflect upon different factors to help MOOCs become a successful tool to educate millions. Through this study, educators can further explore the possibility and viability of introducing the factors in their institutions to enhance learners' educational outcomes.

Methodology:

Through a descriptive research methodology, the paper explores the extent to which MOOCs can provide and promote online learning in a vast and diverse country like India. The paper has touched upon some of the government sources, such as the Report of Census 2011, Human Development Report 2016, 2018, and Economic Survey 2016, and also analysed the data taken from three National Coordinators, namely the Consortium of Educational Communication (CEC), University Grants Commission (UGC) and Indira Gandhi National Open University (IGNOU) under SWAYAM and also from several secondary sources of information relevant to the study.

Literature Review:

Digital inter-connectedness offers a new face of learning that reminds the tectonic shifts in society where data is no longer an indoor, individualistic activity. However, after the utilisation of new tools, an individual's work and performance get altered. The education sector, acknowledging the impact of the latest learning tools, needs to be faster; therefore, it needs to find out the environmental changes it suggests. Siemens is right when he says that connectivism provides perceptiveness to learning skills and tasks required for the learner to flourish during a digital era (Siemens, 2014). The success of digital connectivity and the knowledge that came out of it finally led to an explosive launch of MOOCs to the extent that several universities, companies, and not-for-profit organisations, along with other e-learning platforms, have come forward. Moreover, over the past so many years, different universities across the globe, in their endeavour to make these courses available to their students and the general public, have engaged in an agreed effort to introduce and expand the use of MOOCs.

In 2011, Sebastian Thrun and other colleagues at Stanford University introduced a free academic course on the subject to offer an educational platform for interested candidates in studying artificial intelligence. The course enjoyed an overwhelming response, with one hundred sixty thousand participants from 190 countries enrolled. Not only this, but a similar level of interest also followed in the subsequent development of MOOCs by several universities and other educational institutions. In less than two years, says Waldrop, 62 educational institutions launched 328 open e-learning courses and enrolled almost 2.9 million students from 220 countries (Waldrop, 2013, pp. 160-163). These figures themselves strongly acknowledge that learning can, without any restrictions, be accessible to all looking for it.

Bonk and Reynolds suggest creating new challenges through online learning activities so that online learners can link new information with the old ones they already know. Moreover, online learners may acquire more knowledge by developing meanings and using their knowledge-acquisition abilities (Bonk & Reynolds, 1997, pp. 167-178). Furthermore, it is for this reason that Kozma, to affect the quality of learning, focuses on using a strategy related to education technology (Kozma, 2001, pp. 266-275). McGhee and Kozma, in their paper, point out the specific features of a computer that can simulate real-life learners (McGhee & Kozma, 2003). However, it is a fact that it is not the machine but rather the design of simulated features based on real-life situations that can enable the learners to interact successfully with those models. A computer, Clark rightly says, should be considered more as a means of motivating students (Clark, 1983, pp. 445-459). The concept of working behind open-source courses encourages collaborative writing where a large number of learners can produce and share their knowledge. Mackness and Mak, while defining collaborative writing, rightly consider it to be a creation of projects and other works collaboratively written by many people, not individually, and that the design of these projects needs no supervision (Mackness & Mak, 2010).

Findings and Discussion:

The Historical Background of MOOCs:

With a history of almost 20 years, MOOCs are still in the process of transformation and settlement; therefore, nobody can categorically describe a MOOC. However, founded by the Massachusetts Institute of Technology (MIT) in 2001 (Goldberg, 2001), MOOCs are the natural evolution of Open Courses Ware. Unsurprisingly, MIT also leads the development of MOOCs, first with MITx and then with edX. Initially designed for a group of twenty-five enrolled, fee-paying students to study for credit, MOOC also opened up to register only learners across the globe. Consequently, more than 2,300 people participated in the course without paying fees or gaining credit (Haenlein & Kaplan, 2016, pp. 441-450). Since then, MOOCs have become a label for many recent online course initiatives launched by several institutions, individuals and commercial organisations.

The Indian government, too, through different initiatives, is providing and supporting the concept of open education. In the beginning, the government aimed to offer open resources in terms of repositories, libraries, educational media files, e-books, etc., to be accessed by everybody. National Digital Repository of IGNOU, Sakshat providing e-content, Sishya for XI-XII students by CBSE, and Vidya Vahini integrating IT into rural schools' curriculum by giving interactive training and developmental communication are some of the major efforts taken in this direction. Some of the common names among these initiatives, which started with the intention of establishing dedicated departments to make education reachable to maximum learners, are Education and Research Network (ERNET) that, by providing network connectivity, connects different colleges and schools; EDUSAT, a satellite launched for education; Consortium for Educational Communication (CEC), a means of educational knowledge dissemination; and Information and Library Network Centre (INFLIBNET), an autonomous Inter-University Centre that connects university libraries. All these initiatives equipped with IT help those who are still out of the reach of MOOCs. The Indian institutes, having organisational capabilities with governing authorities by regularly offering MOOCs, are striving to meet the growing educational needs of the learners. Topmost institutes like IITs, IIMs, and IISc and authorities like UGC, AICTE, and MHRD have always been trying to provide Indian learners with quality education, both traditional as well as online. NPTEL, mooKIT offered by IIT Kanpur, IIT Madras and IITBX of IIT Bombay are some of the projects currently providing online education. SWAYAM is the most recent initiative started by the government aiming to serve learners on a large scale, coping with their increased needs (Thomas, 2017, pp. 17-26).

MOOCs under SWAYAM – a paradigm shift in Indian Higher Education:

India, with a rich demographic dividend, has 54% of its total population under the age of 25, whereas 66% is under 35 (Ministry of Home Affairs, Govt. of India, 2011). However, the adult literacy rate at all Indian levels is 69.3%. Considering the percentage of the population above the age of 25 and older having access to secondary education, we can find a huge gender gap, with females constituting 39% and males 63.5%. Besides, as far as the Labour Force Participation Rate is concerned, males amount to 78.8% and females 27.2% (UNDP, India, 2018). These data clearly indicate the need for more adequate skills among the learners, primarily adults, to secure livelihood opportunities. On the contrary, the prerequisites for getting jobs and securing a livelihood in a digital economy require every person to be well-equipped with digital skills. Here, different types of online learning, including MOOCs, can help the learners acquire relevant and required digital skills and knowledge of a subject.

The emergence of SWAYAM can best be viewed as an Indian response to the prevalence of the online learning culture in the 21st century. The MHRD, Govt. of India, having considered the potential of MOOCs in transforming society, introduced SWAYAM in 2016 to make the people of India avail of online courses offered by teachers from national institutions such as IITs, IIMs and Central Universities. Seven national coordinators like NPTEL for engineering, UGC for postgraduate education, CEC for undergraduate education, NCERT and NIOS for school education, IGNOU for out-of-school learners and IIMB for management studies were given the charge of ensuring the quality of course contents produced and delivered through SWAYAM. The UGC, owing to the credit framework for online courses out of the total number of courses through SWAYAM Regulation 2016, mentioned the fast mobilisation and dissemination of knowledge and information among the prospective learners, a release of at least 20% of materials by an Indian university.

The UGC then, to make the learners able to choose from among the prescribed courses referred to as the core, elective or minor, or soft skill courses, came up with the Choice Based Credit System (CBCS) and asked learners to study at their own pace and that they would be awarded a grade, based on a credit system (University Grant Commission, India, 2018). The government, through the UGC, is promoting academic excellence in the area of choice, providing adequate flexibility while choosing the subjects and developing a student-centred curriculum. The UGC has also recommended that all universities develop, besides releasing their OER materials as MOOCs in the SWAYAM platform, an LMS (Learning Management System) to make education more vibrant and sustainable. The emergence of MOOCs under various educational institutions in several relevant areas of

knowledge, against this very backdrop, is a welcome move to make thousands of learners benefit from a range of required MOOCs with almost no restrictions.

Nisha and Senthil, explaining the state of MOOCs in India, have presented an interesting summary of the role technology has played in changing the face of distance education over the years and the relevance and benefits of these courses for distance learners. They find India to be the only economy experiencing such a rapid change with the futuristic idea of the education provided through MOOCs. However, they also find it one of the biggest challenges to make education available to the common masses in remote villages spread across the country, and they also find MOOCs as a solution. The authors have referenced several free-of-cost MOOC platforms such as The Open University, Iversity, ALISON, Open Learning, Coursera, Udacity, edX, and Educate to meet this challenge. While discussing MOOC availability, they have referred to the Birla Institute of Technology and Sciences (BITS), Pilani's collaboration with MIT and edX to offer MOOCs, apart from their own students, to outside learners, too. They have further also referred to the Indian IITs joining their hands under the NPTEL programme funded by the MHRD, Govt of India, to deliver MOOCs. Despite their finding that offering timely support and assessment of learners is the most challenging task regarding MOOCs, they strongly believe in the huge potential of MOOCs and online education in the Indian context in ensuring and accelerating social cohesion and sustainable growth (Nisha & Senthil, 2015, pp. 82-89).

Singh and Chauhan, in their pertinent study about the awareness of MOOCs in India, think of MOOCs as the most effective means for pre-service and in-service teachers' training programmes to develop them professionally. The authors selected 156 teacher educators to assess their level of awareness from Elementary and Bachelor of Education institutes; the authors found that most of the teacher educators have ideas about MOOCs, their strengths, their mode of offering the courses and their benefits. However, they also found that most educators need to improve their understanding of the role of MOOCs in teachers' training and initiatives of MOOCs under SWAYAM. The study findings include that 34.52% of educators need to be aware of what SWAYAM stands for, and only 38.9% know about its launch date and year. The response of the educators, having been asked about the nature of courses offered by SWAYAM, was quite scattered. Around 70% of the educators were knowledgeable about the diploma and certificate courses, around 53% knew about degree-level courses, and around 32% knew about courses at the senior secondary level. The authors finally conclude by emphasising an emergent need to develop teacher educators' understanding of MOOCs and offering them the facilities so that they can integrate MOOCs into their regular classroom practices (Singh & Chauhan, 2017, pp. 81-88).

Bandalaria, in a broader perspective, has made some important observations about MOOCs' significant role in transforming and empowering Asian higher education. Mentioning the creation of MOOC platforms and its country-wise national providers' presence since 2013, she finds these initiatives witnessing the development of MOOC platforms by some countries to offer online courses by the respective universities, whereas some other countries still providing MOOCs through major players like Coursera, edX and Open Learn. She also finds some other national MOOCs providing platforms, like SWAYAM in India, K-MOOC in Korea, J-MOOC in Japan, Thai-MOOC in Thailand, OpenLearning.com in Malaysia, University Joint Alliance Platform in China, and the MODEL for the Philippines getting emerged on educational horizons. The MOOC initiatives, taken country-wise, have been helpful in providing important avenues to the universities and collaborative agencies, monitoring the open learning mechanism's quality, and formalising national policies to recognise the learning taken by completing these online courses. She finds these MOOC platforms enable credit transfer across the disciplines at both undergraduate and postgraduate levels and offer learning opportunities so that the masses' productivity level can develop (Bandalaria, 2018, pp. 116-132).

UNESCO, too, as a part of its endeavour to build inclusive knowledge societies through ICTs, one of the key objectives of UNESCO's Medium-Term Strategy, developed a total of nine modules, five for researchers and four for the Library Schools, on Open Access (UNESCO, 2015). The member states of UNESCO, adopting this goal, recognised knowledge's role in economic growth, social development, cultural enrichment and people's democratic empowerment. Hence, to bridge knowledge pools on Open access across the globe, UNESCO issued a mandate to work on the Open Access policy. Moreover, the Indian universities, by consulting those modules as models, can also develop and design a MOOC on research and library in the SWAYAM platform.

It is imperative to note the extent and the ways the MOOCs, under SWAYAM in India, are becoming able to create the much-needed knowledge movement. A severe inquiry needs to be initiated to determine the extent of these courses' ability, offered through different coordinating agencies under SWAYAM, to suit people's learning needs and also to bridge the digital gap among the learners who might have hitherto remained deprived of the digital revolution. In addition to an unprecedented contribution to the knowledge movement, different MOOCs under SWAYAM can also go for CBCS as dictated by the UGC Regulation 2016 (MHRD, Govt. of India, 2016). The government intends to make the Indian education system internationalised and standardised across the country

from the eighth standard to a higher level. The transfer of credit, through the MOOCs under SWAYAM, among the students from different universities needs to be initiated to make the students, irrespective of sex, age, and place, able to avail learning opportunities. However, further study is required to determine the actual contribution of current MOOCs in credit transfer in both traditional and Open and Distance Learning Universities in India.

Comparative Study:

A number of studies of significance in different parts of the globe have discussed the purpose and usefulness of MOOCs in offering learning opportunities. Here are some of those studies that show the potentiality of online learning in general and MOOCs in particular in addressing the requirements of the changing profiles of the learners:

- I. Grade change, tracking online education in the USA: The 11th Annual report on tracking online education in the USA shows that Allen and Seaman have, while exploring the nature and extent of online education, analysed a comprehensive sample of active, degree-granting higher education institutions in the USA. The report finds an increase in the percentage, from 2.6% to 5% over the past years, of the higher educational institutions currently running a MOOC. The majority of the institutions (53%) showed their undecidedness about MOOCs, while more than 33% of them responded that they had no plans for a MOOC. Only 23% of the academic leaders, i.e. 5% less than in 2012, have shown their belief that MOOCs represent a sustainable method for providing digital courses. However, many higher education leaders have shown their uncertainty regarding the students or institutions benefiting from MOOCs. They have also expressed their doubts about MOOCs having a real impact on cost-effective higher education (Allen & Seaman, 2014).
- II. Opportunities and challenges of MOOCs: Perspectives from Asia:- J.C. Chen, the author of the paper, finds in the study that a person accessing vast quantities of information daily in the modern age requires a reasonable acquaintance of oneself with a learning opportunity. Chen, for this purpose, finds a library to be a social institution and powerhouse. Libraries, for traditional distance learning, are required to serve as a focus of academic support. Referring to Sebastian Thrun, the co-founder of Udacity, for his realisation of the dream of learning through blended and online learning, his efforts to bring education at the doorsteps to the unreached and providing opportunities to the non-traditional learners in need of pursuing learning, Chen further explains the importance of accessing online learning opportunities so that the people can be trained and made competent with information literacy through academic libraries, the providers of pedagogical support. MOOCs make sense with digital libraries, significantly blending the MOOC-specific platform and learning resources in supporting learning. C-MOOCs, for example, can also be helpful for areas lacking adequate online infrastructure and resources. Chen mentions Khan Academy of India for providing resources freely to everyone to foster the openness movement and aggregate and remix the resources to tailor them to learners' requirements. Most importantly, Chen wants to suggest sharing such platforms across Asia and the world even more widely (Chen, 2013).

The review of some successful cases of MOOC implementation suggests the cherishing of equality, quality, and inclusive education through a welcome move by the government of India to start offering online courses under an indigenous national platform, SWAYAM, in 2016. However, examining the actual implementation of the courses under SWAYAM needs equal importance so that a true picture of the state of online courses in India can be made visible. The studies above are also helpful in pondering the actual ability of the courses under SWAYAM to offer learning opportunities and the possibility of credit transfer through the existing MOOCs.

Current Status of MOOCs in India:

To make education accessible to all and reap the advantages of world-class education, India requires a nondiscriminatory and inclusive pedagogy. The Government of India intended to promote an internationalised education system through SWAYAM in 2016. A report, in this regard, presented by the Ministry of HRD in the Lok Sabha says that "Till 2018, more than 39 Lakhs learners have been enrolled in more than 1,600 MOOCs that have been run through SWAYAM, and 60,000 persons have completed the courses. A credit transfer facility of up to 20% has been enabled through the notification – Credit Framework for Online Learning Courses through SWAYAM Regulation 2016 – issued by UGC/AICTE. It is the endeavour of MHRD to align the courses on the SWAYAM portal with the curriculum of Universities" (PIB, 2018). Again, having a comprehensive view of the courses offered through three prominent National Coordinators of SWAYAM, such as CEC for undergraduate, UGC for postgraduate and IGNOU for out-of-school learners, one can find a low percentage of the enrollment trend, the number of courses and certification under UGC and IGNOU compared to CEC. The figures in Table 1 depict the current status of MOOCs offered by these three National Coordinators:

The data analysis in the above table shows the important details of the present mode and popularity of digital education in India. However, the different educational institutes across the country may adopt and produce some need-based MOOCs under SWAYAM so that some learning opportunities, in the true sense of the term, can be introduced. The courses run through SWAYAM, and in this way, they can help achieve the three cardinal

principles – access, equity, and equality – of Indian education policy. The UGC has notified the Indian universities of the identification of the courses suitable for transferring the credit on the basis of the student's academic records for the courses done through SWAYAM. The UGC, by this notification, seems to be assuming that credit transfer can be helpful in bringing flexibility into higher education, allow continuous global mobility to learners and make them able to pursue subjects/courses of their choice from interdisciplinary, intradisciplinary and skill-based courses. Thus, it can lead our education system to match the available systems and patterns of international education.

Challenges of MOOCs in India:

In the age of industry and technology, MOOCs have become one of the most potent tools to offer quality learning opportunities worldwide. Country-wise, different national digital platforms in both developed and developing countries have evolved, resulting from the explosion of knowledge and technology. In India, policymakers and education providers are focusing more on implementing several online courses in a virtual learning mode. However, because of variations in the availability of adequate resources in different parts of the country, the outcome or success rate of these courses, in a real sense, is yet to be fully assessed. The following challenges seem to be standing before the implementation of MOOCs in India:

- a) The introduction of a common framework for the MOOCs-based education system by the UGC is practically difficult in a diverse country like India.
- b) Owing to the non-viability of quantification of units and counselling hours in curriculum transactions, designing a curriculum based on experiential learning pedagogy is not so easy.
- c) The teachers' and administrators' lack of knowledge and training to use ICT-based technologies in both schools and higher educational institutions remains an issue to be taken utmost care of.
- d) The teachers need more motivation to shift their teaching methods from chalk-talk to techno-pedagogy in India is also a matter of great concern. Besides, the education providers or academic institutions using MOOCs are also lacking in awareness of the existing techno-pedagogical skills.
- e) To offer ICT-based learning opportunities, the prerequisite is proper infrastructure. It needs effective materials, human resources and media culture. However, India, having access to Internet connectivity and other necessary facilities for a smooth running of course, hugely requires digital equality.
- f) The usefulness of MOOCs to promote the CBCS, facilitate credit transfer ideas at both UG and PG levels, or increase the completion rate of these courses by Indian learners also lacks proper research.
- g) Questionable course quality, high dropout rate, unavailable course credits, ineffective assessments, complex copyright and limited hardware, are other notable reasons that cause MOOCs to lose popularity. The data, shown in the above Table 1, second it.
- h) Offering MOOCs for learning through SWAYAM also needs more adequate research that, consequently, causes difficulty ascertaining the existing MOOCs' success rate. Hence, a detailed analysis of the various existing MOOCs and their utility offered by the National Coordinators through SWAYAM is required.

Prospects of MOOCs in India:

Instead of talking of some divided opinions on their role, MOOCs enjoy a widespread agreement for continuity in the growth of their importance. The true value of MOOCs, for the most part, lies in their opening up the accessibility to knowledge, previously reserved for a small elite, to the common masses. MOOCs offer an incredible and unique opportunity to learners that most Indians were unaware of just six years before. MOOCs have unsurprisingly garnered a lot of attention and users, too. Now, learners can, by taking free MOOCs offered by several institutions, get an opportunity to have a taste of education at some of the world's top universities without spending a penny and leaving their homes.

MOOCs, especially x-MOOCs, can deliver high-quality content, taken from some of the best universities in the world, for free to learners with a computer and an Internet facility. Learners, particularly in developing countries like India, can use MOOCs for successfully open access to high-class content, but it requires a good deal of adaptation and substantial investment in local support and partnerships by the providers of MOOCs. The traditional and particularly elite institutions, forced by MOOCs to reformulate their strategies towards open online learning, have now been able to extend their brand and status by making their expertise and excelling in certain academic fields public. The main value proposal of MOOCs aims to eliminate, through computer automation and peer-to-peer communication, the very high variable costs in higher education in India. The lectures, assessments, and activities for an online course, as well as the professors' expertise behind the content, are costly.

In most cases, these are unique to a particular university. MOOCs, built on the efficiency of scale, can allow the professor to teach more than just a few dozen students at a time, thus throwing open the door of his/her classroom.

Unlike traditional university credentialing, MOOCs can be offered with or without a certificate or 'badge' indicating the completion of the course by a student.

The unique features of MOOCs, such as scaling, learning communities, scheduling and credentialing flexibility, suggest that MOOCs can solve certain problems in higher education. They are the future of higher education in India.

Conclusion:

A new type of social transformation, with an encouragement for more and more digital intervention in education, is presently being floated across the planet. Several global analyses have been done related to implementing online courses, particularly in developing countries where 70% of education is provided online. However, MOOCs in India are less popular with a large portion of society. The UGC, too, had to promote CBCS and credit transfer in Indian higher education, making 20% of course delivery mandatory through MOOCs. The CBCS, for the time being, has yet to yield the required result as it suffers from several loopholes, such as being introduced without sufficient groundwork and a majority of the people needing to be fully aware of its implementation processes. The UGC is mandating credit transfer through MOOCs aimed at introducing an educational system to establish equality between Indian higher education and Western or European ones. However, this also requires a detailed study based on a survey of the common problems that need to be resolved first, responsible for MOOC differentiation in India and an analysis of the situation, which is essential to meet the challenges faced by Indian learners.

MOOCs, however, as already proved by various researchers in the present era, are the future of online study. They have, across the world, not only made education accessible to everyone, everywhere, every time, but also given a new direction to avail the quality educational opportunities offered by several public and private players. Providing quality education as well as sustainable education requires offering courses through the blended model, which is suitable for the present Indian context. The Indian universities, as think tanks, are required to play leaders in educating learners and the common masses about MOOC interventions under the SWAYAM platform. Besides, the technical utility of MOOCs, considering some empirical studies done on the existing MOOCs by several leading universities across the country, requires further addressing. The new social constructivism of learning through MOOCs, thus, needs serious scrutiny in days to come.

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LEARNING-TRANSFER-RESULT METHOD OF EVALUATING THE EFFECTIVENESS OF MASSIVE OPEN ONLINE COURSES IN HIGHER EDUCATION

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ABSTRACT

The objective of this research is to have a constructive influence on the development of online courses, consequently raising their enrollment, acceptance, and completion rates. Massive Online Open Courses (MOOCs) are designed to make education accessible to all students on a global scale. MOOC platforms have rapidly grown in recent years as a result of the COVID-19 pandemic and even the online learning trend. However, due to variables including course quality, internet connectivity, and lack of exposure, MOOCs' reach has been constrained. Students who sign up for MOOC courses frequently drop out owing to variety of reasons, such as a lack of interest or inadequate learning. The effectiveness of MOOCs among students has been the focus of numerous research. These research help MOOCs develop and expand. Student feedback is a well-liked metric for assessing a MOOC's efficacy. The Learning-Transfer-Result (LTR) technique is suggested in this research as a way to assess the efficiency of MOOCs in higher education. This technique was developed using Student feedback, who registered in various online courses, were asked to provide input under the headings of learning, transfer, and results. The replies were then examined. The findings of this study offer guidance to organizations who intend to produce online content in the future and to improve student retention rates through course customization.

1. Introduction

Massive open online courses (MOOCs) have become one of the most significant advancements in digital education over the past few years as a result of the Covid-19 pandemic, including some of the world's most prestigious institutions, corporations, and firms. They are web-based, structured learning initiatives and are a well-liked educational alternative. Anyone can engage for free without being required to fulfil any knowledge or demographic restrictions. Although MOOCs are frequently seen as a useful format for digital training, their efficiency is still up for discussion. In attempt to provide a detailed explanation of the factors influencing learners' success and course completion in MOOCs, this research will look into success and completion issues from participants with various learning styles and characteristics. The criteria can be revealed in order to develop high-quality courses that increase turnout and prevent the structural flaws that currently exist in MOOCs, enabling the successful and long-term implementation of MOOCs. This research suggests using the Learning-Transfer-Result (LTR) technique to evaluate how effective MOOCs are for higher education. Our proposed model is loosely based on Kirkpatrick Model of Student Learning and Evaluation. Kirkpatrick Model comprises of 4 steps - Reaction, Learning, Behaviour and Result.

2. Literature Review

According to MOOC.org, The Massive Open Online Course (MOOC) is a free online course that enables anyone to sign up and study online (Kusumastuti and Tjhin, 2021). Based on computer tablets and technology, there are numerous massive online courses; Coursera is the biggest MOOC platform, for instance The COVID-19 has disrupted the normal teaching-learning role across the world, massive open online courses are one of the crisis management solutions to ensure that education is continuous and not disrupted (Batsurovska, 2021). Factors have been recognized as being essential to the growth of MOOCs based on a comprehensive literature review are: system quality, information quality, service quality, attitude, course quality, and satisfaction. Today many universities around the world offer various MOOCs. Learning is a complex phenomenon that can be described from different perspectives. Understanding learning is about understanding not only learning processes but also the conditions that influence—and are influenced by—the learning process (Albelbisi, 2020). The authors of have done a study on Learning Management system and the impact of them in Learners (Cherkaoui et al., 2015). Perhaps the most common metrics for assessing course success are retention and completion rates. They require calculating how many students (out of those enrolled) remain active as the course unfolds and meet the criteria needed to finish it (Padilla Rodriguez, 2020). The same author has done a research on how size of the course matter for retaining the students (Padilla Rodriguez, 2019). In the recent research conducted by (Khalid et al., 2023) a hybrid approach has been suggested to detect the impact of e-learning among students. They have conducted the research based on the feedback received from around 1000 students where the discussions that happen in the learning forum were captured and techniques were used to extract the relevant information for conducting the study. People that

apply for MOOCs may not just be interested in completion, but also in improving their skills in general, or they may just be looking for better job opportunities. Another common indicator of MOOC success relies on learner feedback. Most evaluations take the form of end-of course surveys that assess satisfaction and sometimes perceived learning (Batsurovska, 2021). Providing learning recognition appears to be a powerful indicator of user engagement and persistence in the MOOC. According to their research study, interaction and collaboration enable learning through interpersonal relationships, teaching, and technology, have a key impact in how effective a MOOC is to a learner “Global learn,” 2015. During the pandemic, it was evident how MOOCs played an active role in teaching learning (Anand Shankar Raja and Kallarakal 2021). The authors of (Cahapay, 2021) have discussed the limitation of Kirkpatrick model for evaluating the education at higher levels. According to that study, the model is flawless but the problem is implementation of the model in higher education. A similar evaluation study was conducted by the authors of (Dewi and Kartowagiran, 2018) to assess student learning outcomes after completing an internship program. This study incorporated the examination of all four levels, with particular emphasis on the behavior level and results level, achieved through the use of questionnaire surveys. The same model was implemented in the study (El Nsouli et al., 2023) to assess the performance in pharmacy course students. In similar study conducted by the authors of (Embi et al., 2017), Kirkpatrick model was used to evaluate blended learning in a multimedia learning environment. Kirkpatrick model has been used to measure the performance of students in the field of medical sciences also as mentioned in (Liao and Hsu, 2019). The model was used in one of the thesis submitted by the author of (Miller, 2018).

3. Methodology

The methodology we have adapted in this study is loosely based on Kirkpatrick's Four Levels of Training Evaluation.

3.1 Measuring the Learning Effectiveness

Online course learnability, also known as learning effectiveness, refers to how quickly and easily students may pick up the necessary information, skills, and knowledge. The scope of learnability is a critical contributor that you should pay heed to. Once this has been determined, we may evaluate the progression from knowledge acquisition to application, which is reflected in performance improvement. Online Courses should be designed to ensure that learners are adequately prepared for the primary learning experience. This includes tasks aimed at addressing motivation, learner objectives, self-confidence, and the evaluation of prerequisite skills.

The scope of learnability evaluation can be visualized in two different ways:

Initial Learnability: Initial Learnability refers to performance over a single, brief usage period.

Extended Learnability: Extended Learnability refers to performance evolution over time.

The importance of learnability is evident. Only carefully designed courses with the proper learnability can improve student performance and assist companies in achieving their objectives.

According to studies, students waste up to 40% of their time because of "frustrating experiences" with the courses. Common causes include missing, elusive, useless, and irrelevant characteristics of the course curricula.

3.2 Measuring the Level of Transfer

Simulations and assessments are great options to determine if the students comprehends your information. These resources do not guarantee that audience members will continue to apply what they learned in class to their daily lives. We need to continue monitoring and testing their application of the course material in the weeks and months following course completion. The learning activities should be integrated into the instructional design process to enhance the transfer of acquired knowledge and skills. Examples of such activities include practice exercises, role modelling, setting learning objectives, and reviewing and providing assistance for real-world applications.

3.3 Measuring the results in Learning

Online Courses have different definitions of results. Measuring results is based on how students get benefitted after completing the course. It can be in the form of getting better grades in academic evaluation or in the form of securing placements in that particular domain. Other forms of activities may be designed to make sure to support the utilization of acquired skills. Included within this category are activities like managerial guidance, peer support, linking learning to job roles, and fostering a culture of continuous learning.

Our proposed model has three levels of evaluation – Learning, Transfer and Result. The following diagram Fig. 1 depicts our proposed model.

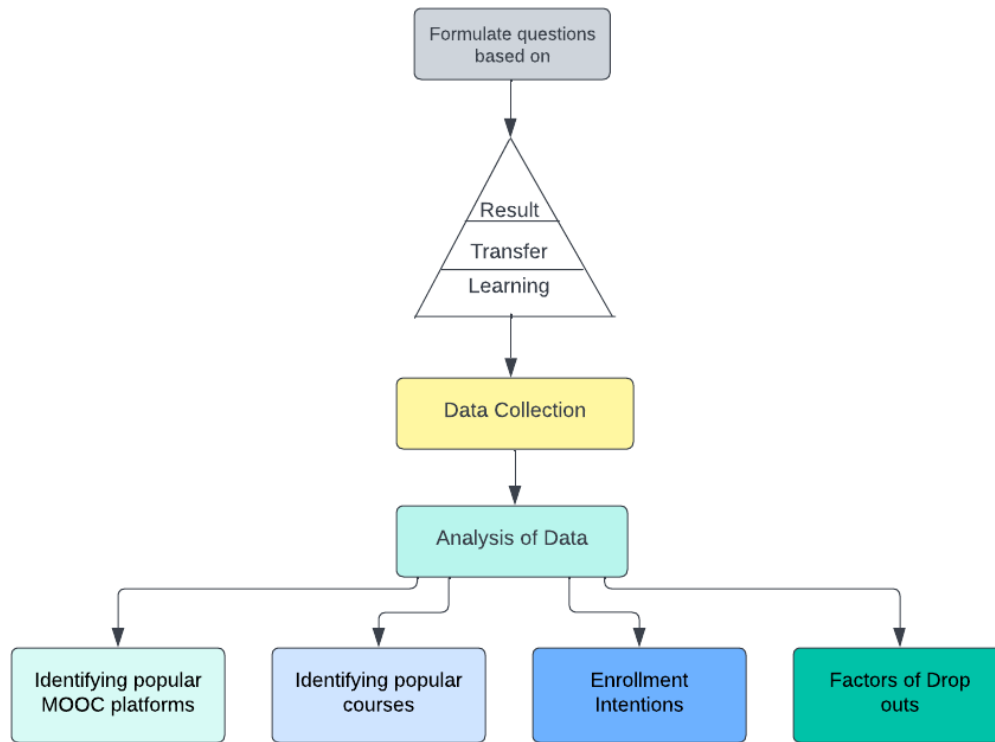


Fig. 1 Proposed Methodology

4. Data Collection

In this study, we have used questionnaire as the main data collection technique. An online form was carefully designed based on our proposed model. Questions were based on three criteria – Learning, Transfer and Result. Students of higher education were asked to respond to the questions. The following table 1 lists the questions and their categories.

S.No	Questions	Expected Responses	Category
1	Number of online courses enrolled	Number	NA
2	Number of online courses completed	Number	NA
3	Reason for not completing the course	Poor course design Lack of Motivation Duration of the course was lengthy	Result
4	Purpose of enrollment	To supplement curricular and academic learning To learn a new domain For better career opportunities	Result
5	Most effective mode of learning	Video Tutorials Course Notes Textbook References	Transfer
6	Were Hands-on practical topics and demonstrations covered ?	Yes / No	Learning
7	Were the course assignments aligned to the course syllabus	Yes / No	Learning
8	preferred mode of learning	Self-paced / Deadline-based	Transfer
9	Availability of Tutor for solving doubts and trouble-shooting.	Yes / No	Learning
10	Mode of applying the knowledge you have gained in online course	Job Opportunities / Academics	Result

11	Rate your knowledge on the domain before the course	Rating based	Transfer
12	Rate your knowledge on the domain before the course	Rating based	Transfer

Table – 1 Categories of Questions

5. Analysis and Discussions

Based on student responses, the following inferences could be derived.

1. Around 62% of the applicants completed the course
2. Not being motivated to complete is the reason majority of students have cited for not completing the course among other reasons like Duration being too lengthy and course structure being not appropriate.
3. Around 40% of the students wanted to learn a new domain and around 25% of the students have pursued online courses for better job opportunities and for supplementing curricular and academic prospects.
4. As expected, 70.3% of the applicants vouch for Self-paced learning instead of deadline based learning.
5. More than 75% of the applicants prefer having video tutorials as a way to gain better understanding of the topics.

The observations have been depicted pictorially in the graphs 2-4.

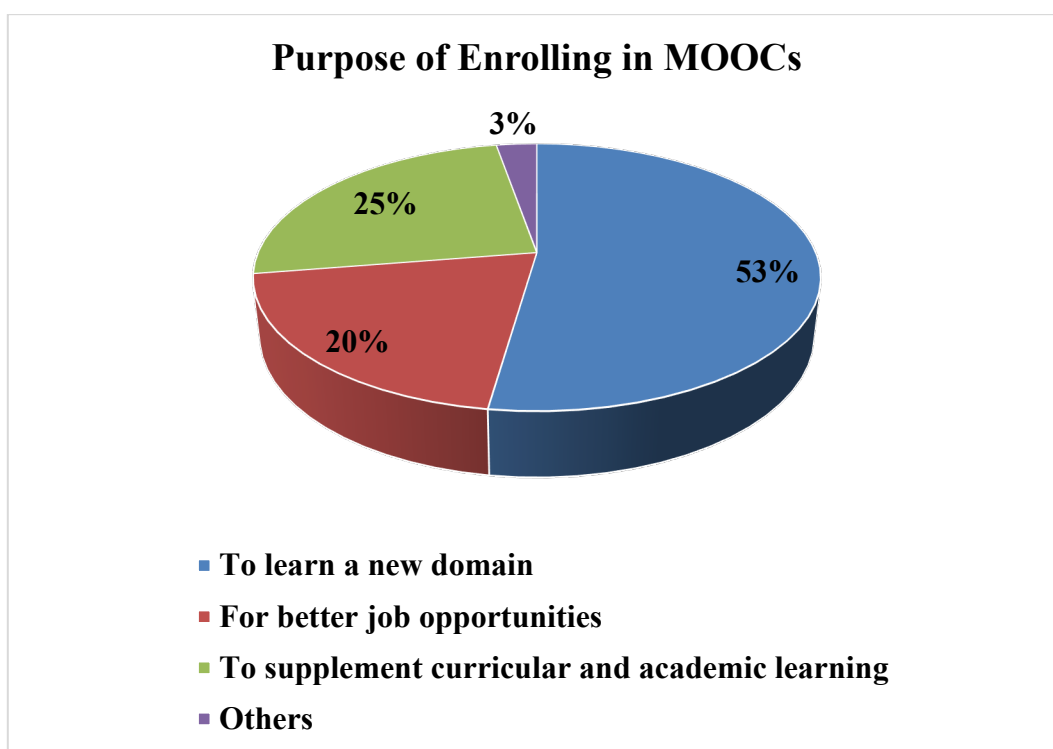


Fig. 2 – Purpose of Enrolling in MOOCs

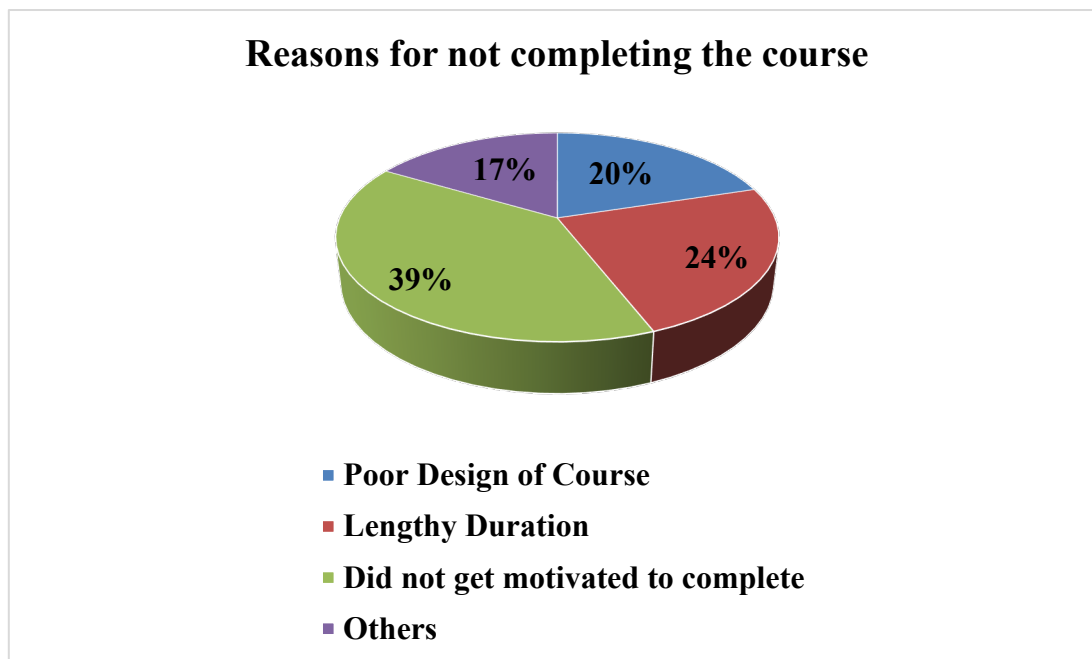


Fig. 3 – Reasons for not completing the course

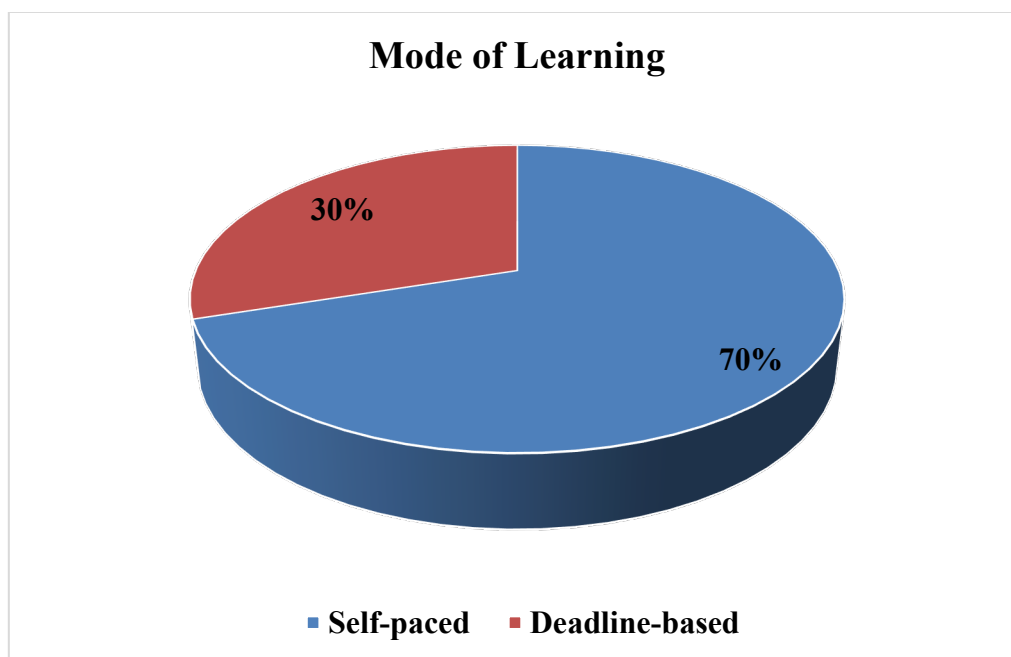


Fig. 4 – Mode of Learning

6. Conclusion and Future Scope :

Implementing Massive Open Online Courses as a supplement to classroom teaching has always been a topic of discussion. MOOCs provide an opportunity to extend the learning beyond classrooms. Gauging the impact of online courses on students' learning processes involves assessing various factors related to their engagement, knowledge acquisition, and overall experience. Various methods such as comparing the students' performance before and after taking the online course, evaluating whether students have achieved the stated learning objectives and goals, collecting feedback from students through surveys to understand their experiences and perceptions, retention and drop-out rates, etc. This study has attempted to gauge the impact of online courses in students' learning process. Responses of Students pursuing higher education were taken into consideration. This study also provides insights on how online courses can be designed to attract more students to enrol and to achieve a better retention percentage and we have tried to find out the reasons for completing the course thereby giving directions to the course providers to incorporate changes in their course structure and design. The future scope of this study

would be to evaluate the effectiveness and impact of MOOCs in the teaching process – how teachers have utilized these courses to improvise the whole teaching-learning process.

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SCOPE OF DISTANCE LEGAL EDUCATION IN DIGITAL AGE-FUTURISTIC APPROACH IN INDIA

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ABSTRACT

Legal education is one of the most dynamic fields as it deals with diverse interest groups and provides various undergraduate, graduate, postgraduate, and doctoral programs and multiple courses.

The objectives of the article are to identify the scope of distance education through the digital mode of communication and problems of digitalisation of legal education, as well as formulate directions for introducing a distance legal education framework. Further, the present article will analyse the scope of distance learning in professional and non-professional legal education. The present article will discuss issues in the adoption of distance legal education approach by law schools in India in the context of the post-COVID pandemic.

The UGC and BCI in India have suggested specific changes in the existing framework of legal education. The changes are needed to re-envision in the context of the COVID-19 pandemic. The COVID-19 pandemic has forced us to rethink the transformation of legal education with demographic and technological changes. The information and technological disruption will forever transform the future of both legal education and legal practice.

The present article will develop a framework for distance legal education through recommendations and suggestions.

Keywords- legal education, information and technology, distance education, massive online open courses, the constitution of India

1. INTRODUCTION

Law schools in India and most countries have always practised traditional classroom-based lecture methods (**Ruta K. Stropus, 1996**). The legal education system has stayed the same for decades. The 21st century, especially the pandemic period, has started revolutionary changes in means of communication. Online or distance education has also elevated itself to accept the new mode of communication and tools. The distance education mode is defined as the interaction between the faculty and students through technology to support the course instruction and activities required to carry by distance mode. This new communication mode is facilitative. Therefore, tertiary education has switched to online learning platforms using digital communication. These changes can be seen in higher education, primary, secondary, and other professional-level courses (**Meinck & Sabine, 2022**).

On the other hand, legal education revolves around changing nature according to the practical aspect of law (**Farzana Akter, 2016**). Law students have adopted the digital education mode during the problematic pandemic and faced challenges and limitations during the online learning process. The private education sector has progressively adopted massive online open courses (MOOC) platforms and changes in communication methods of teaching in the digital era of technology. (**Farhan Sheikh, 2021**)

The digital/online education platform is a new way to communicate and impart legal education, and it has even been accepted under the Bar Council of India (BCI) and University Grant Commission (UGC) rules and regulations made during the COVID-19 pandemic period. However, the scope of the same was that acceptance was limited in nature (**Sreejith, S. G., 2021**) The BCI has released the online examination and promotion policy for students who attended online classes during the pandemic (**BCI, 2020**).

1.1. Historical background of open and distance education in India

Open and Distance Learning in India came into the picture in 1962. The Delhi University had introduced distance learning courses through the school of correspondence courses and continuing education. The very objective of distance education was to enable the students who needed more time to complete their education. Accordingly, the central government incorporated Indira Gandhi National Open University (IGNOU) in 1985. This major government move was considered a milestone in the history of education. As this change has recognised the right to education in a broader sense, access to education is made open and accessible without age or other barriers or restrictions. Further, the central government established the Distance Education Council (DEC) in 1991. As per

the IGNOU Act, the DEC will be responsible and accountable for promoting and regulating open and distance learning (ODL). In 2009, a joint committee of UGC, AICTE, and DEC released the guideline document called '*Recognition of Open and Distance Learning (ODL) Institutions' Handbook 2009 (India)*. Accordingly, UGC is responsible for acting as regulatory authority over the ODL and related matters. But moving on further, in 2012, the central government decided to exclude technical education from the ambit of UGC. Accordingly, ODL and AICTE could regulate technical education affairs and ODL-related matters. Further, in 2013, the government decided to dissolve the DEC and establish a new authority titled Distance Education Bureau (DEB) under the authority of UGC. The UGC was responsible for handling and regulating all matters of ODL and related matters, including technical education by distance mode.

2. THE LEGAL EDUCATION THROUGH REGULAR AND CORRESPONDENCE MODE.

Distance learning and digital learning are striking trends in the present era. Distance education is one of the favoured modes of education for higher secondary and graduate-level students (**Ritimoni Bordoloi, 2018**) If we compare legal education with other professional courses, distance learning or online education has a minimal role in legal education. However, due to the neo-liberal approach and the advent of technology in communication, the leading law schools are offering online or distance law programmes through centres for distance learning. (**Distance Learning in Legal Education, 2011**) In India, The BCI, the regulatory authority, controls and manages undergraduate legal education, i.e., graduate program in law LL.B. Besides this course, BCI does not regulate any undergraduate courses relating to law. However, some courses relating to law subjects like IPR, labour law, cyber law, human rights, etc., have been offered by universities and colleges with the approval of UGC. At present, in India, LL. B. The course is being provided by law college in regular mode only. Even under BCI rules on legal education, only a standard mode of legal education is allowed, and it shall offered by a recognised centre of legal education(CLE). Hence, a traditional law degree is recognised through regular mode, not through any other mode like open, distance, online, or correspondence learning mode. But there is no restriction on offering degrees, diplomas and certificate courses on law subjects except L.L. B course. Hence, the Indira Gandhi National Open University (IGNOU) flagship offers various law programs through regular and online or distance modes, like a PhD in law by standard mode and a P.G. program through online and distance modes. It includes the certificate program and diploma at U.G. and P.G. levels, for example, certification in consumer protection, cyber law, human rights, postgraduate diploma in criminal justice, and intellectual property rights. But none of the distance or open universities, institutes, or centres, including the IGNOU in India, are entitled to offer professional law degrees, i.e., L.L. B at the undergraduate level.

We can identify why distance legal education has yet to be recognised in India for pursuing the L.L. B program.

- The legal skills that students learn and observe in the offline classroom cannot be effectively taught through distance or online mode.
- The students learn through the case-law method, seminar method, and classroom discussion, which would develop practical skills like argument, negotiation, and presentation that can be executed by students and teachers personally in the classroom. It could not be effectively demonstrated by online or distance mode. (**The Report on transitioning to online legal education – the law faculty, International Association of Law Schools, 2020**)
- Distance mode classes are not suitable even though they're pretty convenient. It cannot replace traditional classroom teaching in law courses because interaction in the classroom is significant. It develops critical analysis and lawyering skills. It is not effectively possible to make online sessions interactive.
- The teaching method through distance education is considered to compromise with the quality advocacy skills, and BCI needs to recognise bar standards and such a degree. Degrees obtained by distance mode may be regarded as acquiring knowledge rather than allowing entry into the legal profession. (**Sumana De - vs State of West Bengal & Ors. M. A. T. 2013**), (**India**)
- The system of distance education programmes has been considered an alternative mode only, and this system could not replace the formal mode of education, i.e., the regular mode of education, especially in the case of professional degree education like law, medicine, and engineering. It is not suitable for these courses (**Annamalai University vs Secretary to Govt. Information and Tourism Dept. 2008**) (**India**)
- Distance education needs more credibility due to the unrestricted entry of public and private players, which may go against the interest of students and their professional development as lawyers. There needs to be proper regulatory norms to standardise the quality of professional education through distance mode or online mode (**Prof. N R Madhava Menon, 2012**)

3. NEED FOR DISTANCE LEGAL EDUCATION

Regulatory authorities like BCI in India have not adopted distance legal education mode despite justifiable demand from legal education stakeholders. But, with the advent of new communication technology, the correspondence/online/distance mode plays a vital role in legal education and other sectors. In the 1990s, the internet and digitalisation of education facilitated access to information and knowledge without barriers. (**Jharna**

Sahijwani, 2020) Further, the role of digital and distance education has been proven in the pandemic period when there was no way to access education offline or through traditional modes. There was a life-threatening situation wherein the right to livelihood, life and liberty of individuals was subject to restrictions of lockdown norms. Hence, the education system shifted to online and distance mode. The pandemic has given us a more comprehensive approach toward access to education and forced us to rethink and revise the regulatory framework of imparting education by traditional mode.

The education shall be accessible and enjoyable beyond the limit of lockdown or pandemic situations. (**Lael Weinberger, 2021**)

Legal education is crucial in matters of access and adjudication of justice. There is a need to consider an alternative mode of imparting legal education. In the era of information and technology, there is a scope and need to switch from the traditional mode of imparting education to the modern and digital/distance mode of legal education (**Susmitha P. & Mallaya, 2020**)

3.1. Distance legal education and access to justice -why it is required beyond limitations

The UGC has made distance education applicable and recognisable while imparting higher education at U.G. and P.G. levels. There are some exceptions to the UGC regulation—for example, legal education.

In the age of information and technology, there are thousands of barriers to traditional forms of the education system in a country like India; primary education is still the dream of the weaker section of society (**Lalitha Bhagavatheeswaran, 2016**). On the other hand, the cost of legal education at U.G. and P.G. levels is beyond the economic limit of the ordinary person. The increased cost of legal education directly affects diverse enrollments and leads to disparity in the inclusion of various sections of society. The socio-economical background forces students to compromise with the quality of education. (**Sardar Ali Shah, 2023**)

Nowadays, elite private law schools and so-called modal law schools, i.e., NLUs, are accessible to economically sound people who can manage the course fees and other academic financial burdens (**Dasgupta, U.2019**). Distance mode learning is a modern form of learning that allows students to enrol without any territorial limitation; even though students have some economic, physical, or other constraints, they can manage the expenses and achieve their educational goals (**Dr. Vibha Sharma, 2021**). There may be better options than lowering the cost of education, which would compromise the quality of education. However, providing a distance mode option may effectively maintain the quality of education.

According to Mujumdar S.B. (the founder of Symbiosis International University), the distance education mode opens great opportunities to obtain higher education and professional knowledge without any restrictions, and a country like India shall keep distance education mode as an additional and not alternative mode of education while considering the significant population and territorial limitations.

4. THE SCOPE OF DISTANCE LEGAL EDUCATION AND LEGAL ISSUES OF REGULATION

As Justice A.S. (**Anand A.S., H.L.1998**) pointed out, legal education shall be required to fit with society's socio-economic transformation and within the limit of constitutional philosophy. Further, he said that law and legal education should not be restricted to professional skills that confine advocacy to courts and litigants. Legal education shall always reflect the social character. So, we don't require a typical advocate restricted to the court practice, and we also don't require an ordinary academician limited to the law books and bare acts. In a globalised world, what is needed is that students be trained to interpret law not only in the courtroom but also in the classroom. We need law graduates who will be researchers and experts in law analysis in adjudicating justice (**A.M. Varkey, 1991**)

In the post-COVID pandemic effect context, stakeholders made strong positive movements and supported legal education and the profession for online and distance legal education. This attempt was to move over the traditional form of legal education, i.e., classroom learning. (**Apoorv Shrivastava, 2021**) The digitalisation of the legal service sector and education has promoted digital or online and distance legal education. This approach toward legal education has been incorporated in teaching law subjects at U.G., P.G. and another academic degree, diploma and certificate programs.

To a certain extent, UGC has legalised and recognised this attempt under its regulation. NLUs, private law schools and some elite law schools have opened distance education centres and offer a few certificate courses in business and corporate laws, taxation laws, cyber laws, international laws, human rights, arbitration and mediation laws and P.G. diploma courses and even P.G. programs in law like LL.M courses. Moreover, Under the flagship *Digital*

India, The government of India has launched the *Study Webs of Active-Learning for Young Aspiring Minds* (SWAYAM) program. The online distance education platform provides a digital platform to learn courses while pursuing formal education. This platform offers the opportunity to enrol in any program online and in a distance mode without restrictions. Also, this platform provides a wide range of courses, certifications and learning opportunities in most subjects, including law and professional education. **(Kishore Singh,2019)**

4.1. Existing regulatory framework and scope of distance legal education

The UGC and governmental educational agencies have promoted online or distance education in almost all subjects. However, UGC has prohibited specific programs that cannot be offered through open and distance learning modes and online modes, including law and other professional courses. Legal education in India is regulated and controlled by BCI, a statutory authority under the *Advocate Act, 1961, (India)* and the *UGC Act, 1956 (India)*. UGC is the apex authority in higher education matters in India **(Upendra Baxi, 1975-1977)** The BCI has the power to promote legal education and lay down standards of such education in consultation with the universities in India. **(Advocates Act, 1961, India)**, Section 7(h)) Further, BCI has the comprehensive power to recognise universities that can award degrees in law, and their degree shall be considered a qualification for enrollment registration as an advocate with the state bar council. Shall be a qualification for enrolment as an advocate. **(Advocates Act, 1961, India)**, Section 7(i)

However, when discussing the legal education available in non-profession degrees, certificates, and diploma courses, The BCI has yet to make concrete standards to regulate norms of such classes, i.e., curriculum, examination and assessment norms, medium of instruction, mode or form of instruction. Accordingly, university norms for regulating standards would be final and valid.

The BCI role is restricted and limited under the scope of section 7 (1) of the *Advocate Act, 1961(India)*. **B. Ramkumar Adityan vs Secretary Department of Higher Education, Ministry of Education and others,(2020), (India)** The non-professional degree, certificate and diploma shall not confer any right to enrol as an advocate with the state bar council. However, BCI has been claiming the power to regulate P.G. and research degree (PhD) programs in law. The apex court must still validate the BCI rules to bend research degrees. Said matter is still pending before the apex court. **Tamanna Chandan Chachlani Vs. Bar Council of India (2021), (India), Rishabh Soni Vs. Bar Council of India (2021) (India), Consortium of National Law Universities Vs. Bar Council of India (2021), (India)**. These courses shall comply with the standards when BCI comes with the regulations.

The Existing framework of legal regulations has minimal scope to allow distance or online modes of education. The BCI has strictly said no entry to distance mode of education in the case of U.G. programs like LL.B. **(Legal Education-2008, India)**. Still, when it comes to P.G. programmes in law, LL.M. and other non-professional degrees, diploma courses, and certificate courses have opened doors to welcome distance or online education because these courses fall into distinct categories. Even BCI has yet to claim authoritative power to regulate under the authority of the **(Advocate Act of 1961, India)**. But BCI has moved into controlling P.G. and research degree programs in law by making *The Bar Council of India Legal Education (Post Graduate, Doctoral, Executive, Vocational, Clinical and other Continuing Education) Rules, 2020 (India)*. However, this law is subject to conformity from the apex court of India.

4.2. Current scenario of distance legal education and available platforms

The trend in education has changed after the COVID-19 pandemic period. We experienced the importance of digital technology and communication platforms during the pandemic **(Aaron J. Saiger, 2020)** The BCI norm strictly prohibits the enrollment of students with two programs at the same university or with a different university **(BCI Legal Education Rules, 2008, India)**. But BCI has allowed students to take up additional programs, value-added programs or certificate programs, U.G. diplomas, or certificate programs with the same university or different universities provided that the program shall be short-term courses or provided in distance or online mode. Therefore, most law schools offer short-term programs while pursuing a law degree. However, the rules allow students to enrol in short-term certificate courses or courses run in the distance education mode.

The shift to digital online mode classrooms was the inevitable impact of the pandemic situation, and somewhere, digital mode education was literary through the distance mode wherein academic instructions, assignments, examinations, activities, and events were conducted online. To a certain extent, we can say that shifting to virtual classes saved the student's educational interest. **(Roy, R., & Sharma, P. 2023)**.

4.3. The MOOCs and distance education centres of universities and colleges.

Massive Open Online Courses (MOOCs) are initiatives under the *National Mission on Education through Information Communication Technology (NME-ICT)* Programme. The government initiative is to provide

education through distance and digital modes to many students in diverse locations. These are the learning opportunities offered by the university, colleges and distance learning centres. The website-based technology is being used to deliver education to students who are geographically far from the college or university. MOOC courses aim to impart education and professional knowledge, enhance employability skills, value addition and skill development among students.

The MOOC courses play an essential role in learning and enhancing law knowledge (**Jing-fang Zheng,2019**) The leading law schools and universities have already offered a wide range of diplomas, certificate courses, and value-added courses in the emerging field of law. This platform has features of flexibility of time and location. It was popularised and familiarised during the COVID-19 pandemic period. (**Mr Lagdhir Rabari,2017**)

The UGC and other government universities have offered MOOCs law certificate programmes and courses through the SWAYAM platform. It provides an integrated one-stop digital platform for online and distance mode courses, and it uses information and communication technology (ICT) and digital technology to reach out to students and facilitate them in learning and acquiring skills and practical knowledge. Further, this platform offers a variety of courses and certificates in all subjects of higher education.

5. PROBLEMS OF DIGITALISATION OF LEGAL EDUCATION AND DISTANCE MODE EDUCATION

The digitalisation of legal education has become integral in the context of globalisation. The COVID pandemic and post-pandemic period have accelerated the digitalisation of data and sources, too. Digital or online communication was the only way we maintained the lockdown protocol. It was proven that we could revisit the legal education policy and consider adopting online or distance modes of education wherever possible and suitable. Accordingly, legal education can be imparted to students by adopting ICT tools and technology.

There are some substantial problems and issues of digitalisation. One of the significant issues is the digitalisation of information and data in education and case laws. It is possible only when the digitalisation of information and data of education materials and case law data. (**Prof. Dr. A. Lakshminath,2013**)

The material problems of digitalisation and distance education mode are highlighted below (**Rebecca Purdom,2015**)

- Technical problems with accessing compatible and high-speed internet facilities.
- The coordination between students and faculty during online classes is a substantial challenge (**Muthuprasad T, Aiswarya S, Aditya KS, & Jha GK., 2021**)
- Accessing educational sources and data that cannot be disseminated online is challenging. (Library resources, hard-bound books and study material which is not digitalised) (**Sarika Sawant, 2021**)
- Technical glitch assistance and system support are required during the online or live session to ensure the effectiveness of the class and continue the learning process (**May & Diane,2014**)
- Maintaining student engagement throughout the course is challenging, especially if the program or course is a theoretical or philosophical subject.
- No standard policy exists in the legal education for regulation and accreditation of CLEs and law institutions that want to adopt distance legal education. (**Sharma & Yogesh, 1994**)
- The absence of state recognition and professional bodies, for example, bar councils (BCI in India) to distance legal education of a professional nature like L.L. B or professional law degree, is one of the constraints in adopting distance legal education policy at the undergraduate level.
- Starting an online or distance learning platform requires registration of colleges or faculties at government agencies like the education department and the SWAYAM digital platform in India.

The regulatory body and professionals should have been addressed in India almost neglected distance or online learning. (**Santi Kundu, 2014**) However, the outbreak of the COVID pandemic has changed the scenario and compelled us to switch from traditional modes of education and boost online or distance learning in all curricula, including law. However, the approach toward distance or online learning in law courses shall be adopted and progressive in the digitalisation age and globalisation.

6. ADOPTION OF DISTANCE LEARNING AT INTERNATIONAL JURISDICTIONS.

Most progressive nations have adopted the hybrid mode of education at higher level courses, including legal education—for example, the USA. The American legal education system has adopted the mixed mode of education wherein few courses or credits can be earned through online or distance learning. Such courses shall comply with the standard norms of degree or qualification required to register or enrol lawyers at the state bar council or association. For example, an ABA-approved law college can adopt distance education mode to a J. D. degree, but

such credit shall be at most one-third of credit hours of the program's total credits. The American Bar Association can recognise J.D. degrees offered by distance or online.

Distance education is familiar to the United Kingdom (U.K.). The U.K. has a concrete history of distance education in legal education and other professional degrees, U.G., P.G. and PhD levels. In 1969, the royal charter opened the door for distance legal education at U.G. and P.G. level law programs. The Open University has been incorporated under the royal charter with objectives to provide higher education and reach every adult citizen in the U.K. and worldwide, **(Bilate Bisare, 2021)**.

The Open University is a leader in distance education in the U.K., offering a wide range of degrees, diplomas, certificate courses, and expert professional training programs in law. Their degree is recognised for enrollment as a solicitor, barrister, paralegal, or chartered legal executive in the U.K. and Wales region. The U.K. universities are offering law programs through traditional modes of education. However, some branded universities have adopted liberal and modern approaches to legal education and opted for distance or digital learning platforms for both U.G. and PG-level law programs. Moreover, they also prefer hybrid modes of education that include opportunities to learn through distance learning, for example, the University of London, the University of Oxford, etc. **(Dr. Abdullah Al Faruque, 2021)**

European countries also have adopted a progressive approach toward distance and online learning modes. The European Association of Distance Teaching Universities (EADTU) is the international European Association of Distance Universities established in 1987. This association is the leading partner in European nations. The objectives of EADTU are to provide diverse opportunities through hybrid, blended and online modes for campus and off-campus education. Further, EADTU has aimed to support continuing education and professional development through guidelines, a short-term model for online and distance learning curricula, and the assessment and accreditation of the university.

We can cite here a few universities that are the pioneers in founding the base of distance education and providing continued support in the professional development of adults and students who could not complete their formal education due to other constraints **(Moeketsi Letseka & Victor J. Piteoe, 2012)**. These universities focus on disciplines like arts, commerce, sciences, humanities, economics, mercantile law, computer science and management, information and technology (ICT), communication and technology and never the list, law and politics. *The Universidad Nacional de Educación a Distancia (UNED)* -National University of Distance Education of Spain, came into the picture in 1972 to open distance education mode for continuous support and fill the gap of higher education through continuing education policy. *The FernUniversität in Hagen* in Germany has been imparting education through distance mode since 1974. The Open Universiteit Nederland was established in 1984 on the model of the Open University of Great Britain. *The Universidade Aberta (UAB)* – is located in Portugal and has been awarding degrees and diploma certificates in higher and professional education since 1988. *The Universitat Oberta de Catalunya (UOC)*, i.e., The Open University of Catalonia, is the world's first online virtual university. Established in 1995, it offers a wide range of degree, diploma, postgraduate, and doctoral programs through distance mode or digital online mode. The Open University of Cyprus (APKY), a public university in Cyprus, has offered education through distance mode since 2002. The International Telematic University (UNINETTUNO) was incorporated in Italy in 2005. In Greece, The Hellenic Open University was founded in *Patras* and exclusively provides opportunities to learn professional education through distance and online modes of education. **(Julia Tsarapkina, 2021)**.

7. CONCLUSION AND RECOMMENDATIONS

Distance or digital learning has strongly supported education during the COVID-19 pandemic. Further, it has also catered for the socio-economic and educational needs of developing countries like India. The digital age of the 21st century demands a global and liberal approach to education that would benefit the majority of society. Digital technology and tools are successfully adopted in most disciplines like science, humanity and social science, health sciences, management, engineering, etc. The open and distance universities and centres provide a variety of professional skill development, knowledge enrichment, and value-added courses at U.G. and P.G. levels. Most disciplines widely recognise and adopt the distance education mode to complete graduate degree education.

However, in the case of legal education, the distance or open education mode needs to be fully recognised by UGC and BCI rules. The Indian legal education and service sector reflects the common law and civil law systems. As discussed earlier, the most progressive nationals, like the USA and the U.K., have adopted the liberal approach by adopting distance legal education mode at U.G. and P.G. levels of education. We have adopted the norm of regulating the entry of advocates at the bar, which is the philosophy of the U.S. and U.K. legal systems.

Then, why has the open or distance education mode yet to be adopted or approved for a U.G. degree in law, i.e., L.L. B in India? UGC and BCI have yet to breed this question with proper and justifiable reasonings.

There is an excellent opportunity to cater to society's needs in India through the distance learning mode of education. Legal education is fundamental and related to adjudicating justice. It is expected to be open and easily accessible by each individual without any restrictions. Present regulatory norms are incompatible with adopting the available and distance education mode in legal education. It is required to adopt the liberal, progressive approach while teaching and learning law.

Ultimately, I suggest a framework (a few aspects) for adopting open distance legal education at all levels, i.e., U.G. and P.G. levels.

- Existing open universities like IGNOU can partner with UGC and BCI to regulate academic, curriculum and graduate requirements for law degrees to be offered by recognised centres or CLEs.
- BCI may amend existing rules or make new rules on legal education, which would incorporate a hybrid mode of education (regular and distance mode), including adopting a distance mode of education as an alternative or additional.
- University and BCI rules may be amended to allow students to learn or acquire academic credits through hybrid or distance education.
- BCI may standardise the curriculum and core courses to be exclusively offered in regular modes, such as compulsory courses, as BCI norms recommend.
- BCI, UGC and the university may come up with new patterns of evaluation and assessment that can be different from the regular mode of education. (For example, multiple choice-based pattern, tutorial and practical-based assignments)

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SMARTPHONE USE AND ITS IMPACT ON THE ACADEMIC PERFORMANCE OF THE UNDERGRADUATE STUDENTS

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ABSTRACT

The present study was conducted to determine the amount of smartphone use, its impact on academic performance, and its health effects on undergraduate students. A total of 240 undergraduate students from the Arts and Commerce streams of Doomdooma College, Assam (India) were selected as samples through the purposive sampling technique. The descriptive survey method of research was followed. A self-made questionnaire and an in-depth interview with the teachers and students were used for data collection. The results of the study reveal that most of the undergraduate students use smartphones in their day-to-day lives, in the classroom, for study, and to communicate with others. Excessive smartphone use has rigorous health effects relating to sleeplessness, tension, headaches, eye strain, etc.

Keywords: Smartphone, Academic Performance, Undergraduate Students, Health Effects etc.

Introduction

In the 21st century, society has witnessed that technology is becoming an indispensable part of life. Smartphones are one of the most popular ICT tools used by almost all categories of people. A smartphone is a sophisticated portable device that combines all the advantages of a mobile phone with computer functionality. Litchfield, S. (2010), opined that a smartphone is a mobile device with an open operating system and a constant internet connection. Numerous programs, including video calling, web surfing, calendaring, weather information, a camera, a navigator, and many more, are available on this device. Because of their manifold functions and low cost, smartphones have become more popular among users (Kaur, N. 2018, p. 242).

Among younger generations, smartphones have grown to be a fantastic and vital instrument for communication. The use of smartphones has been seen to have significantly increased during the past several years. At present, an individual considers himself or herself incomplete without possessing a smartphone. Smartphone use has completely changed every aspect of human existence, including commerce, sports, entertainment, health, education, and research. Everyone stays in contact with it on any given occasion, whether it be at a family gathering, place of employment, or public space. Studies show that most people, particularly the younger generation, are always on their phones, reading messages, sending or viewing videos, updating social media, conversing, and engaging in other activities. As a result, these activities have become an essential part of people's lives. (Rather, S. A. & Khazer, M., 2019).

Portability and price of smartphones played the most important role in making this device more popular among all sections of the user base. Smartphones are used by people for many different things, such as watching, navigating, chatting with friends and family, accessing the internet, getting weather broadcasts, clicking photos, and capturing videos. Smartphone use has also become extensively popular among school and university students. The use of smartphones has helped people in a number of ways, but its use has certain drawbacks too. In many cases, the use of smartphones has become an addiction, and many people spend a significant portion of their working, playing, learning, and even sleeping hours engrossed in their smartphones. Thus, the use of smartphones in our lives is so tremendous that it has affected not only our personal lives but also our behaviours, habits, culture, health, attitude, communication system, and education to a large extent. Under these conditions, the current study aims to investigate how smartphone use affects college-bound teenagers' lives and academic achievement.

Smartphone use and academic performance

The way students approach their studies and how they finish the many assignments that teachers offer them are referred to as their academic performance (Bedassa, F., 2014). Numerous investigations and studies carried out across the globe have demonstrated a strong correlation between students' use of social media and their academic achievement. Constantly using social media diverts students from their academics and may have an impact on their academic achievement.

Unrestrained use of mobile phones for social networking, texting, and talking has been linked to lower grades and poor academic performance in students, according to numerous research studies conducted worldwide. (TT

Sundari, 2015, p. 904). The research findings demonstrated that some students had a propensity to use their cell phones to disturb others while studying and taking classes, even in the library. Thus, the extensive use of smartphones by the students in day-to-day life, during class, and during study time enormously affects their academic performance. The goal of this study is to ascertain whether smartphone use has a beneficial or detrimental effect on undergraduate students' academic performance.

Literature Review

Numerous global research findings show that smartphone use has both beneficial and harmful effects on a child's academic achievement. Many researchers suggested smartphones use affect students both ways, academically as well as in their personal life. A few relevant studies have been reviewed here.

Ng, S. F., and others (2017) studied the extent to which students at a Malaysian university use smartphones to enhance their academic performances and the relationship between these activities and their CGPA. Data was collected over a period of seven days from 176 students enrolled in three academic programs. The sampled students recorded how they used smartphones every day for education. Findings of the research showed that students' CGPA decreased with the amount of time they spent using their smartphones. It also indicated that there is a need to assess and comprehend smartphone instructional applications for students in higher education.

Ifeanyi, I. P., & Chukwuere, J. E. (2018) examined the effect of smartphone use on undergraduate students' academic achievement at North-West University in South Africa. Data were collected using a questionnaire from 375 undergraduate students. The results of the study indicated that most of the samples used their iPhones to interact with teachers and other students. Additionally, it was discovered that using a smartphone interferes with respondents' academic performance in some ways. The outcomes also demonstrated how smartphone use affects children's academic progress and abilities.

Kaur, N. (2018), carried out a study to examine the extent of young people's addiction to cell phones, the effect of students' use of phones on their academic achievement, and the degree to which mobile phones have permeated young people's lives. Purposive sampling was used to choose a sample of 50 Chandigarh University graduates and undergraduate students, from which data was gathered through the administration of a survey. The researcher used a self-constructed questionnaire for data collection. The findings of the study indicated that the participants were severely influenced by mobile phone usage. A large number of participants spent the whole day using mobile phones, which distracted them from their studies.

Nayak, J. K. (2018) studied the effects of smartphone addiction on students' academic achievement and how using a smartphone is influenced by gender and relationship status. A self-made questionnaire was used with a sample of 429 students from universities and technological institutions in India. Findings of the study indicated that the usage of smartphones was higher for females than male students. However, in the case of the male students, the impact of smartphones on performance was shown to be quite significant. It was discovered that female students showed essentially no signs of smartphone addiction, in contrast to male students, who showed signs of work neglect, anxiety, and loss of self-control.

Mukhdoomi, A., and others (2020) conducted research on the impact of smartphone addiction on the scholastic achievement of higher education students. The purpose of the study was to investigate the effects of smartphone addiction on the scholastic achievement of college learners. Data and related information were collected from a sample of 500 Iqra University North Campus Karachi learners through a numerical study technique. The correlational investigation approach was adopted. The results of the study indicated that the pupils' scholastic achievement was positively impacted by their smartphone behavior in a statistically meaningful way. Additionally, it was discovered that students use their smartphones for entertainment, which causes them to become drowsy and may have an impact on their academic performance.

The problem statements

Young people are using smartphones more and more frequently. As an advanced technological innovation, smartphones are being increasingly used by young students for making audio and video calls, transferring text messages, social networking, chatting, sending and receiving emails, e-learning, m-learning, etc. They are becoming more smartphone-addicted due to their overdependence on technology in every phase of life. In spite of the numerous benefits and advantages of smartphone use for students' performance, there are many negative impacts and limitations that cannot be overlooked. The research findings of many researchers also indicated contradictory results. Lepp, Barkley, and Karpinski (2014) looked into the issue and discovered that smartphone addiction has a detrimental effect on college students' academic performance. According to Hawi & Samaha

(2016), smartphone addiction has a detrimental effect on academic achievement but a favourable influence on life satisfaction. Therefore, it becomes essential to conduct comprehensive research on the potential benefits and drawbacks of smartphone use for the scholastic performance of higher education learners. The present study attempted to understand whether smartphone use among undergraduate students affects their academic performance positively or negatively.

Significance of the Study

The use of smartphones among the learners of higher education institutions has been increasing tremendously around the world. Numerous studies and surveys conducted in different nations show that young people are using smartphones at an earlier age and at a faster rate than ever. The age range of nearly half of mobile internet users is 18 to 25. Research indicates that the frequency of smartphone use varies between nations and at different ages (TT Sundari, 2015, p. 898). A literature review indicates that there are numerous studies carried out to ascertain the consequences of smartphone use by students. But the query remains on whether approval of smartphone use facilitates or undermines learning. There is a dearth of research on the effects of smartphone use on college students' academic performance in this locality. Accordingly, the investigator chose the problem to investigate the influence of smartphone use on the academic standing of the undergraduate pupils. It is expected that the results obtained will add to the assets of knowledge currently available on smartphones and their effect on their educational performance. It would determine whether smartphone use can be beneficial for college students' academic performance and their health impact on them, which may be crucial for parents, teachers, administrators, policymakers, and researchers. Consequently, the findings of the present research work may help these initiatives by raising cognizance at the ground level.

Objectives of the Study

The research work was carried out with the following objectives:

1. To determine the amount of smart phone use among the undergraduate students.
2. To investigate how undergraduate students' use of smartphones influence their academic performance.
3. To find out the health effects of smartphone use on undergraduate students.

Research Questions

Keeping in view the objectives of the study, the following research questions were formulated:

1. What is the amount of smartphone use among the undergraduate students?
2. How does smartphone use influence the academic performance of undergraduate students?
3. How does smartphone use effect on undergraduate students' health?

Methodology

Research Method. A non-experimental, descriptive survey method of research was followed in the current study. The questionnaire survey method was used for collecting data from the participants.

Population and sample All the degree second and fourth semester students of Doomdooma College, Assam (India), studying through regular mode in the Arts and Commerce streams in the year 2022 comprised the population of this research work. A total of 240 undergraduate students' (n = 240) from Doomdooma College, Assam (India), were selected as a sample. The sample was collected from the Arts and Commerce streams of the college studying in the second and fourth semesters through the purposive sampling technique, since it was convenient for the investigator to approach the participants individually and to observe their behaviours constantly.

Tools Used. Data and relevant information were gathered from the participants using a self-created questionnaire. The sampled undergraduate students were asked to complete a self-made questionnaire containing nine items concerning their opinions and attitudes towards the impact of using smartphones in their day-to-day lives, courses, self-study, and academic performance. In-depth interviews with the teachers and students were also carried out. For the sake of clarity, the scores were rounded to whole numbers.

Data Collection. Primary data was used in this research. The investigator collected the required data from the participants individually. The questionnaire was distributed among the participants in printed form and collected on the spot to guarantee a high rate of return. Data were collected in the month of February 2022.

Data Analysis. The current research work is a mixture of both qualitative and quantitative approaches. The collected data were analysed by adopting quantitative as well as qualitative techniques. Descriptive statistics and qualitative analysis techniques were used for data interpretation.

Data interpretation and findings

The current study was carried out with the undergraduate students of Doomdooma College, Assam (India), to determine the effects of smartphone use on their scholastic achievement. Data gathered by using selected research tools on a sample of 240 undergraduate students were arranged suitably for analysis and interpretation.

Demographic Information of Participants

In order to collect demographic information, questions on their gender, stream of study, and academic levels were asked of the participants. Data relating to the demography of the participants has been presented in Table 1.

Table 1
Demographic Information of Respondents

Characteristics		No. of Respondents (N=240)	%
Gender	Male	128	53.33%
	Female	112	46.67%
Faculty	Arts	130	54.17%
	Commerce	110	45.83%
Academic levels	Degree 2 nd Semester	124	51.67%
	Degree 4 th Semester	116	48.33%

(Source: Data collected through a field study)

Table 1 shows the demographic characteristics of the sampled undergraduate students in the present study. This comprised three significant features: gender, faculty, and academic levels. Out of 240 sampled undergraduate students, 53.33% were male and 46.67% were female. Students from two faculties—arts and commerce—participated in the study. The numbers of sample from Arts faculty were higher (54.17%) than the Commerce faculty (45.83%). On the other hand, 51.67% samples were from degree second semester and 48.33% samples were from degree fourth semester students.

Amount of Smartphone Use among the Undergraduate Students

The primary goal of the investigation was to ascertain the amount of smart phone use by the participants. Data collected through the questionnaire relating to the amount of smartphone use among the undergraduate students has been presented in Table 2.

Table 2
Amount of Smartphone use among the Undergraduate Students

Items	Responses	Type of Respondents					Total
		Male	Female	Total	Arts	Commerce	
No. of smartphone possessed by the students.	0	02 (1.56%)	06 (5.36%)	08 (3.33%)	07 (5.38%)	01 (0.91%)	08 (3.33%)
	1	113 (88.28%)	104 (92.86%)	217 (90.42%)	119 (91.54%)	98 (89.09%)	217 (90.42%)
	2	11 (8.59%)	02 (1.79%)	13 (5.42%)	03 (2.31%)	10 (9.09%)	13 (5.42%)
	More than 2	02 (1.56%)	0 (0.00%)	02 (0.83%)	01 (0.77%)	01 (0.91%)	02 (0.83%)

Frequency of smartphone checked by the students	Every one minute	15 (11.72%)	22 (19.64%)	37 (15.42%)	25 (19.23%)	12 (10.91%)	37 (15.42%)
	Every five minutes	77 (60.16%)	68 (60.71%)	145 (60.42%)	78 (60.00%)	67 (60.91%)	145 (60.42%)
	Every one hour	27 (21.09%)	19 (16.96%)	46 (19.17%)	24 (18.46%)	22 (20.00%)	46 (19.17%)
	Other	09 (7.03%)	03 (2.68%)	12 (5.00%)	03 (2.31%)	09 (8.18%)	12 (5.00%)
Time spent daily on smartphone by the students	1-2 hours	34 (26.56%)	22 (19.64%)	56 (23.33%)	38 (29.23%)	18 (16.36%)	56 (23.33%)
	3-5 hours	79 (61.72%)	83 (74.11%)	162 (67.50%)	85 (65.38%)	77 (70.00%)	162 (67.50%)
	6-12 hours	12 (9.38%)	07 (6.25%)	19 (7.92%)	06 (4.62%)	13 (11.82%)	19 (7.92%)
	More than 12 hours	03 (2.34%)	0 (0.00%)	03 (1.25%)	01 (0.77%)	02 (1.82%)	03 (1.25%)
Smartphone is a need or status symbol	Need	56 (43.75%)	50 (44.64%)	106 (44.17%)	62 (47.69%)	44 (40.00%)	106 (44.17%)
	Status symbol	22 (17.19%)	47 (41.96%)	69 (28.75%)	38 (29.23%)	31 (28.18%)	69 (28.75%)
	Both	50 (39.06%)	15 (13.39%)	65 (27.08%)	30 (23.08%)	35 (31.82%)	65 (27.08%)
Purpose of smartphone use by the students	Communicating relatives	32 (25.00%)	37 (33.03%)	69 (28.75%)	39 (30.00%)	30 (27.27%)	69 (28.75%)
	Entertainment	43 (33.59%)	15 (13.39%)	58 (24.17%)	40 (30.77%)	18 (16.36%)	58 (24.17%)
	Study	39 (30.47%)	56 (50.00%)	95 (39.58%)	44 (33.85%)	51 (46.36%)	95 (39.58%)
	Game	12 (9.38%)	03 (2.68%)	15 (6.25%)	06 (4.62%)	09 (8.18%)	15 (6.25%)
	Any other purpose	02 (1.56%)	01 (0.89%)	03 (1.25%)	01 (0.77%)	02 (1.82%)	03 (1.25%)

(Source: Data collected through a field study)

Table 2 indicates that 3.33% of undergraduate students did not possess any smartphones, 90.42% had one smartphone, 5.42% had two smartphones, and 0.83% possessed more than two smartphones. Female undergraduate students possessed a higher percentage of one smartphone (92.8%) than male students (88.28%), and arts students possessed a higher percentage of one smartphone (91.54%) than commerce students (89.09%).

In respect of the frequency of smartphones checked by the undergraduate students, it was found that 15.42% of students checked their smartphones every one minute, 60.42% checked their smartphones every five minutes, 19.17% checked their smartphones every hour, and 5.00% checked them every other day. The frequency of smartphones checked by the respondents was the highest (60.42%) every five minutes. It also indicates that the frequency of smartphone uses every five minutes was a little higher for girls' participants (60.71%) compared to boys' participants (60.16%), and in the case of Commerce students (60.91%) than the Arts students (60.00%).

The time spent daily on smartphones by the undergraduate students between one and two hours was 23.33%, between three and five hours was 67.50%, between six and twelve hours was 7.92%, and more than twelve hours was 1.25%. The highest percentage (67.50%) of undergraduate students (61.72% male and 74.11% female, 65.38% arts and 70.00% commerce) were found to spend on smartphones between three and five hours.

Out of 240 undergraduate students, 44.17% considered smartphones as a need, 28.75% considered smartphones as a status symbol, and 27.08% considered smartphones as both their need and status symbol. The number of female students was slightly higher (44.64%) than that of the male students (43.75%), and arts students (47.69%) than commerce students (40.00%) considered smartphones as a need.

In respect of the purpose of smartphone use by the undergraduate students, 28.75% responded that they used smartphones for communicating with relatives, 24.17% for entertainment, 39.58% for study, 6.25% for games,

and 1.25% for any other purposes. It also indicates that 30.47% male and 50.00% female students, and 33.85% arts and 46.36% commerce students, used smartphones for the purpose of their study.

Impact of Smartphone Use on Academic Performance of Undergraduate Students'

The present investigation is intended to ascertain the impact of smartphone use on the academic performance of the sampled students. Data collected through the research tool has been presented in Table 3.

Table 3
Impact of Smartphone use on Academic Performance of Undergraduate Student's

Items	Responses	Type of Respondents					Total
		Male	Female	Total	Arts	Commerce	
Students use smartphone in the classroom.	Yes	62 (48.44%)	58 (51.78%)	120 (50.00%)	42 (32.31%)	78 (70.91%)	120 (50.00%)
	No	66 (51.56%)	54 (48.21%)	120 (50.00%)	88 (67.69%)	32 (29.91%)	120 (50.00%)
Smartphone use helps in learning	Yes	53 (41.41%)	64 (57.14%)	117 (48.75%)	57 (43.85%)	60 (54.55%)	117 (48.75%)
	No	75 (58.59%)	48 (42.86%)	123 (51.25%)	73 (56.15%)	50 (45.45%)	123 (51.25%)
Smartphone use in class distracts from studies.	Yes	82 (64.06%)	79 (70.54%)	161 (67.08%)	93 (71.54%)	68 (61.82%)	161 (67.08%)
	No	46 (35.94%)	33 (29.46%)	79 (32.92%)	37 (28.46%)	42 (38.18%)	79 (32.92%)

(Source: Data collected through a field study)

Table 3 shows that 50.00% of respondents used smartphones in the classroom. The percentage was marginally higher for female respondents (51.78%) compared to male respondents (48.44%) and for commerce students (70.91%) compared to arts stream students (32.31%). This table also indicates that smartphone use helps 48.75% of students (41.41% male and 57.14% female, 43.85% arts and 54.55% commerce) in their learning. This means 51.25% of respondents did not agree that smartphone use helped them in their learning. Again, 67.08% of respondents (64.06% male and 70.54% female, and 71.54% arts and 61.82% commerce students) were of the view that smartphone use in class distracts them from studies.

Health Effects of Smartphone Use on Undergraduate Students'

The current study also looked into how undergraduate students' use of smartphones affected their health. Table 4 below displays the facts and statistics that have been gathered on this.

Table 4
Health Effects of Smartphone use on Undergraduate Students'

Responses	Type of Respondents					Total
	Male	Female	Total	Arts	Commerce	
Sleeplessness	32 (25.00%)	25 (22.32%)	57 (23.75%)	34 (26.15%)	23 (20.91%)	57 (23.75%)
Headache	29 (22.66%)	34 (30.36%)	63 (26.25%)	38 (29.23%)	25 (22.73%)	63 (26.25%)
Eye strain	57 (44.53%)	51 (45.54%)	108 (45.00%)	52 (40.00%)	56 (50.91%)	108 (45.00%)
Tension	07 (5.47%)	02 (1.78%)	09 (3.75%)	05 (3.81%)	04 (3.64%)	09 (3.75%)
Other	03 (2.34%)	0 (0.00%)	03 (1.25%)	01 (0.77%)	02 (1.82%)	03 (1.25%)

(Source: Data collected through a field study)

Table 4 shows that 23.75% of undergraduate students (25.00% male and 22.32% female) suffered from sleeplessness, 26.25% (22.66% male and 30.36% female) suffered headaches, 45.00% felt eye strain, 3.75% (5.47% male and 1.78% female) experienced tension, and 1.25% (2.34% male and 0.00% female) suffered from other types of problems. Faculty-wise distribution of the effects of smartphone use demonstrates that 26.15% of Arts and 20.91% of Commerce students experienced sleeplessness, 29.23% of Arts and 22.73% of Commerce students suffered from headaches, 40.00% of Arts and 50.91% of Commerce students felt eye strain, 3.81% of Arts and 3.64% of Commerce respondents experienced tension, and 1.82% of Arts and 1.25% of Commerce students had other types of issues. This clearly indicates that the consequences of smartphone use for undergraduate students were found to be highest on eye strain (44.53% male and 45.54% female, 40.00% arts and 50.91% commerce), followed by headache (26.25%), sleeplessness (23.75%), and tension (3.75%).

Major Findings of the Study

- Female undergraduate students possessed the highest percentage of smartphones (92.8%). The male students (88.28%), arts students (91.54%), and commerce students (89.09%) possessed one smartphone.
- The frequency of smartphone checks indicates that 15.42% of students checked their smartphones every minute, 60.42% checked every five minutes, and 19.17% checked every hour.
- The frequency of smartphones checked by the respondents was highest (60.42%) every five minutes.
- It was also found that the frequency of smartphone use after every five minutes was a little higher for female students (60.71%) in contrast to male pupils (60.16%), and for commerce students (60.91%) than arts students (60.00%).
- The time spent daily on smartphones by the undergraduate students between one and two hours was 23.33%, between three and five hours was 67.50%, between six and twelve hours was 7.92%, and more than twelve hours was 1.25%.
- The highest percentage (67.50%) of undergraduate students (61.72% male and 74.11% female, 65.38% arts and 70.00% commerce) were found to spend on smartphones between three and five hours.
- Most of the respondents (44.17%) considered smartphones as a need, 28.75% considered smartphones as status symbols, and 27.08% of students considered smartphones as both a need and a status symbol.
- The number of female students was slightly higher (44.64%) than the male students (43.75%), and arts students (47.69%) than commerce students (40.00%) to consider their smartphone as a need.
- The highest percentage (39.58%) of undergraduate students (30.47% male and 50.00% female, and 33.85% arts and 46.36% commerce) used smartphones for the purpose of their study.
- A total of 50.00% of respondents' (48.44% male and 51.78% female) used smartphones in the classroom setting.
- The use of smartphones in the classroom was higher in the case of commerce students (70.91%) than in the case of arts (32.31%).
- 75% of students agreed that smartphone use helped them (41.41% male and 57.14% female, 43.85% arts and 54.55% commerce) in their learning.
- This study revealed that 51.25% of respondents did not agree that smartphone use helps them learn.
- The highest percentage (67.08%) of respondents (64.06% male, 70.54% female, and 71.54% arts and 61.82% commerce students) were of the view that smartphone use in class distracts them from studies.
- The impact of undergraduate students' smartphone use on their health was found to be highest for eye strain (45.00%), followed by headache (26.25%), sleeplessness (23.75%), and tension (3.75%).

Conclusion and Implication

The use of smartphones has become a common feature among youths and students. There are multiple uses of smartphones, such as phone calling, audio and video recording, time-showing, calculating, weather forecasting, entertainment, etc. It makes communication easier amongst friends, family, and relatives. Literature reveals that smartphone use has a massive influence on the health, habits, lifestyle, and learning processes of students. The present research work revealed an enormous amount of smartphone use among the sampled undergraduate students, irrespective of their gender and faculty of study. Most of the female learners possessed a single cell phone. The frequency of smartphone checks by the pupils was highest after every five minutes, which was similarly dominated by the female learners. It was also revealed that the maximum number of samples used their smartphones for three to five hours a day. Most learners considered a cell phone a requirement rather than a status symbol and used it in a classroom setting for learning purposes. Moreover, the results of the research work indicated that undergraduate learners' academic performance was tremendously influenced by smartphone use in both positive and negative ways. Smartphone use in the teaching and learning situation (consulting teachers, fellow students, exchanging notes, attending online classes, etc.) assisted the learners in their learning process, thereby positively influencing their scholastic performance. On the contrary, the investigation likewise revealed that extreme smartphone use had a significant negative impact on students' health and distracted them from the class,

thereby reducing their academic performance. Consequently, the advantage or harmfulness of smartphone use exclusively depends upon the user's intention and extensiveness of use.

The implications of the study derive from making learners cognizant of both the positive and negative effects of smartphone use on their day-to-day lives as well as their academic accomplishments. The young learners, the future assets of the nation, should be prepared to realize that excessive cell phone use may have adverse effects on their eyes, sleep, behaviours, overall health, and lifestyle. They should likewise be aware that the sensible use of cell phones can encourage their learning. Young students may be provided with proper training on smartphone use for learning purposes, and they can also be encouraged to use cell phones with certain applications. However, parents, teachers, counsellors, caretakers, and administrators should shoulder the immense responsibility of witnessing judicious smartphone usage by college-going students and young people for their academic enhancement.

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STUDENT TEACHERS' PROFESSIONAL AND SOCIAL ICT COMPETENCIES

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ABSTRACT:

In the educational system, Information and Communication Technology (hereafter referred as ICT) plays a significant role. Its integration into teaching-learning process helps in providing high-quality education to the learners. Student teachers are the future teachers of a country and play a crucial role in its development. Therefore, they need to be professionally and socially competent in using ICTs. The purpose of this study was to investigate how student teachers perceived their professional and social ICT competencies. A sample of 50 students, who were pursuing B.Ed. were taken from two Indian universities Jamia Millia Islamia and Aligarh Muslim University. Questionnaire was used to collect online data. Data analysis was done by calculating percentage, mean, mode, and standard deviation. The findings revealed that most of the student teachers were found good in almost all the statements of both competencies such as (38.43%) in professional ICT competencies, and (51.18%) in social ICT competencies.

Keywords: ICT Competencies, Professional ICT, Social ICT, Student Teachers

INTRODUCTION

In this present era, ICT is turning the world into a new technology-driven global community (Danner & Pessu, 2013). ICT can be defined as any technology that is used to transmit, process, store, produce, display, share, or exchange data electronically (UNESCO, 2010). It has made significant advancements in teacher education. It prepares prospective teachers to be skilled in the use of ICT so that they can provide quality education to the learners in this technological world. According to National Curriculum Framework for Teacher Education (2009), teacher education should focus on preparing teachers to recognise vitally useful and developmentally appropriate usage of ICT. They should be skilled in handling ICT devices for better professional performance. But this technological advancement has also brought social issues such as ethical, legal, and human issues, data protection, etc. Hence student teachers must be competent in not only how and when to use ICT in teaching-learning but also in social and professional ICT competencies to meet the needs of the present society. National Policy on ICT in school education (2012) stressed that teachers should be trained in digital repositories, copyright concerns, and creative commons licencing. They should be capable of using ICT tools as well. National Education policy (2020) also put emphasis on the adoption of new technologies and digitization of teaching-learning processes. According to Devi (2010), successful implementation of ICT is possible if student teachers and teacher educators are trained in assessing learning, electronic portfolios, and designing teacher and student support materials. They must also have knowledge and skills of social, legal, ethical, and health issues of using ICT tools and resources.

ICT Competencies

ICT competencies mean having sufficient knowledge and skills to use technology. They are defined as the ability to reach, and transfer information utilising tools and technical equipment. They cover any technology that aids in the creation, manipulation, storage, communication, and/or dissemination of information. That is to say, ICT competency is very essential for student teachers to improve teaching-learning in the 21st century (Lawrence & Veena, 2013). According to National Educational Technology Standards for Teachers (2008), teachers should use digital tools and resources to improve their professional competence on a regular basis. It also emphasises

that teachers must be familiar with the idea of local and global societal challenges and obligations in a fast-changing digital world, as well as engage themselves ethically and legally in their professional activities. UNESCO (2018) has also developed an international framework that describes the competencies needed to effectively use ICT by pre-service and in-service teachers; i.e., UNESCO ICT CFT Version 3. Basically, this framework identifies ICT competencies based on six aspects, namely: “understanding ICT in education policy, curriculum and assessment, pedagogy, application of digital skills, organization and administration, and teacher’s professional learning”. National ICT Competency Standard (NICS) For Teachers was developed by the Philippine Commission on Information and Communications Technology in 2006. This document covered mainly four domains of ICT Competency; namely, technology and operations concepts, social aspects, pedagogy and professional. Competencies concerning to professional growth and development, research, innovation, and collaboration are included in the professional domain. Whereas, social aspects category comprises competencies in social, ethical, legal, and human issues, as well as community connections. Husain (2010) has defined a four-category ICT competency framework for teachers: technological, pedagogical, didactical, and social. Hence, various studies have focused on different ICT competencies but this study was conducted by taking only two dimensions of ICT competencies.

- **Professional ICT Competencies** are related with the additional ICT skills and knowledge that teachers obtain for their professional development beyond what they need to learn to become qualified teachers. They can get this additional ICT knowledge and skills through variety of means, including educational programmes, conferences, seminars, events, and workshops, as well as personal experiences and collaboration, etc. (UNESCO, 2018).
- **Social ICT Competencies** are concerned about student teachers’ understanding of social and ethical concerns related to ICT use and apply it to their teaching-learning process. It entails creating and encouraging a technology-supported learning environment that is both safe and secure, as well as promoting equitable access to technology that takes learning, social, and cultural diversity into account. It also covers advantages and disadvantages of computer use, as well as privacy issues, copyright infringement, plagiarism, computer security, etc. (Devi, 2010; Husain, 2010).

CONTEXT OF THE STUDY

In order to achieve the objectives of the study, student teachers who were pursuing B.Ed. (general) were taken from Aligarh Muslim University and Jamia Millia Islamia, India. Aligarh Muslim University offers only B.Ed. (general) course, whereas Jamia Millia Islamia provides three types of B.Ed. courses such as B.Ed. (general), B.Ed. (special education), and B.Ed. (nursery education). The aim of the selected course is to prepare teachers for primary and secondary level.

NEED FOR THE STUDY

ICT has become an integral part of our education system. As a result, the traditional nature of education has been transformed into a modern one. But it has also created some social, ethical, and legal issues that need to be considered while using it. Therefore, student teachers must be competent to use ICT professionally and socially so that they can use it effectively when they enter in teaching profession. According to the report of working group of teacher education for 12th five year plan (2012–17), web portals, open educational resources, mobile learning, wikis, blogs, video conferencing, and web 3.0 tools should all be included in teacher education. National Educational Technology Standards for Teachers (2008) stated that teachers should promote and demonstrate the effective usage of digital technologies and resources in order to advance their professional practice. They should also exhibit ethical and legal behaviour in their professional practices. Bingcang (2014) found that the respondents were low capable in using ICT for professional growth and development. The findings of the study also revealed that the majority of respondents were good at using ICT in an ethical and legal way. Guillo and Guillo (2017) revealed that the teachers were competent in using ICT for professional growth and development. They were also proficient in using ICT socially and ethically. Marcial (2017) stated that teacher educators’ ICT skills in social and ethical domains was rated as “good.” They know enough about social and ethical concepts of using ICT, but they had no experience with actual social and ethical practices in using it. Husain (2010) found that teachers need to be competent in social ICT as a top priority in order to use ICT in ethical, legal and safe manner. Hence, after reviewing several studies on ICT competencies, researchers noted that more researches are needed, particularly in India. So, this research was conducted to find out how student teachers perceive their professional and social ICT competencies.

OBJECTIVES OF THE STUDY

The following were the objectives of this study.

- To study the professional ICT competencies as perceived by student teachers
- To study the social ICT competencies as perceived by student teachers

RESEARCH METHODOLOGY

Population

Population of the present study comprised all the student teachers who were pursuing B.Ed. in India.

Sample

Convenient sampling technique was used to select a sample of 50 student teachers who were pursuing B.Ed. (general) at Jamia Millia Islamia and Aligarh Muslim University, India.

Research Tool

Questionnaire was developed by the researchers with the help of various research studies done by Husain (2010), Chen et al. (2010), UNESCO (2018), and National ICT Competency Standard for Teachers (2006). The researchers also took permission from respective authors. The questionnaire was contained 31 items related to professional and social ICT competencies based on a five-point rating scale-- excellent, good, fair, low capability, and no capability. Two open-ended questions were also designed by the researchers that were based on the professional and social ICT competencies of student teachers.

Analysis and Interpretation of Data

Close-ended questions were analysed by calculating percentage, mean, mode, and standard deviation. For this Google sheet and MS excel were used. On the other hand, open-ended questions were analysed by coding. Charts and tables were used to represent the data.

The researchers also determined the minimum and maximum lengths of the 5-point-Likert type scale to ensure equal distance apart (Jamieson, 2017). For this, the researchers calculated the range. Accordingly, length of the scale was determined as:

- No Capability = 1 to 1.80
- Low Capability = 1.81 to 2.60
- Fair = 2.61 to 3.40
- Good = 3.41 to 4.20
- Excellent = 4.21 to 5

FINDINGS

Objective 1: To study the professional ICT competencies as perceived by student teachers

Table 1: Responses of student teachers about their competence in professional ICT

S. No.	Statements						Mean	Mode	SD
		Excellent	Good	Fair	Low capability	No capability			
1	Designing rubrics to evaluate student performance in the usage of different technologies	10%	36%	30%	16%	8%	3.24	4	1.10
2	Reviewing new and existing educational software	18%	32%	30%	16%	4%	3.44	4	1.09
3	Identifying educational websites and portals related to the subject area	22%	38%	32%	6%	2%	3.72	4	0.95
4	Following online tutorials or training programmes	36%	28%	26%	8%	2%	3.88	5	1.06
5	Improving professional development by attaining ICT skills to increase efficiency	18%	44%	24%	12%	2%	3.64	4	0.98
6	Actively participate in online forums and discussions to increase subject knowledge	26%	32%	24%	14%	4%	3.62	4	1.14
7	Fostering innovation among colleagues by promoting continuous learning	12%	38%	34%	10%	6%	3.4	4	1.03
8	Using ICT networks to access and share resources that help in professional development goals	10%	46%	36%	6%	2%	3.56	4	0.84

9	Using ICT networks to connect with external experts and learning groups to promote professional development goals	14%	28%	44%	8%	6%	3.36	3	1.03
10	Reviewing professional practice on a regular basis to promote innovation and improvement	16%	48%	24%	8%	4%	3.64	4	0.98
11	Analysing digital teaching resources	14%	50%	20%	12%	4%	3.58	4	1.01
12	Licensing and distributing their original teaching resources as open educational resources (OER)	10%	18%	38%	20%	14%	2.9	3	1.16
13	Using ICT to get subject resources and learn new teaching practises to develop professionally within subject areas	18%	44%	22%	12%	4%	3.6	4	1.05
14	Sharing and discussing best practices in teaching by the use of online professional forums	16%	56%	14%	8%	6%	3.68	4	1.04
Overall							3.52	4	1.05

Table 1 shows that among all 14 statements, the statement *following online tutorials or training programmes* (Mean = 3.88, SD = 1.06) represents the highest mean and mode value which indicates that the participants were found good on this statement. Whereas, statement *identifying educational websites and portals related to the subject area* (Mean = 3.72, SD = 0.95) shows the second highest mean value followed by the statements *sharing and discussing best practices in teaching by the use of online professional forums* (Mean = 3.68, SD = 1.04) and *reviewing professional practice on a regular basis to promote innovation and improvement* (Mean = 3.64, SD = 0.98) which implies that the respondents were found good on these statements too but have low mode value as compared to previous statement.

On the other hand, statement *licensing and distributing their original teaching resources as open educational resources* (Mean = 2.9, SD = 1.16) shows the lowest mean and mode value among all these. This statement also represents high deviation. Therefore, it can be said that respondents were found fair on this statement i.e. perceived as the lowest competency by them. However, statement *designing rubrics to evaluate student performance in the usage of different technologies* (Mean = 3.24, SD = 1.10) shows the second lowest mean value and having high mode value as compared to previous statement which indicates that respondents were fair on this statement. In addition, statement *using ICT networks to connect with external experts and learning groups to promote professional development goals* (Mean = 3.36, SD = 1.03) shows third lowest mean and second lowest mode value which pointed out that the participants were found fair on this statement. However, statement *fostering innovation among colleagues by promoting continuous learning* (Mean = 3.4, SD = 1.03) shows the fourth lowest mean value which reveals that the respondents were found fair on this statement. Therefore, overall mean value of this dimension (Mean = 3.52, SD = 1.05) indicates that the respondents were found themselves good in almost all the statements of professional ICT competencies.

Under this dimension one **open ended question** was also asked if they need capacity building in professional ICT.

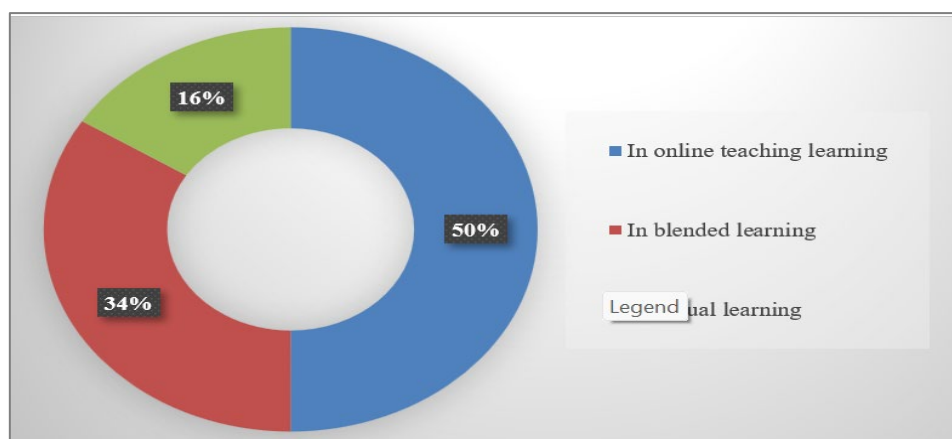


Figure 1: Responses of student teachers about their need for capacity building in professional ICT

Figure 1 clearly indicates that all student teachers were needed capacity building in using ICT for professional growth and development. It was found that 50% of the respondents were not satisfied with their present knowledge about online teaching learning and they think that it is required for professional development as they reported that they need capacity building in online way of teaching and learning including attending and organising online seminars. 34% of them reported that they require capacity building in blended learning for professional development. However, 16% of the respondents reported that they need capacity building in virtual learning for professional development.

Objective 2: To study the social ICT competencies as perceived by student teachers

Table 2: Responses of student teachers about their competence in social ICT

S. No.	Statements						Mean	Mode	SD
		Excellent	Good	Fair	Low capability	No capability			
1	Understanding ICT concepts and its impact on present society and the entire world	28%	54%	16%	2%	0%	4.08	4	0.72
2	Demonstrating knowledge and skills in the ethical, legal, and safe use of technology	18%	68%	10%	4%	0%	4	4	0.67
3	Understanding the legal implications of software licenses and fair usage	20%	38%	34%	8%	0%	3.7	4	0.89
4	Differentiating and identifying copyright, and patent of various educational materials/resources	10%	44%	32%	10%	4%	3.46	4	0.95
5	Detecting plagiarism in students' work	24%	44%	16%	12%	4%	3.72	4	1.09
6	Preparing lessons and activities that are appropriate for the students' learning levels and cultural backgrounds	14%	60%	20%	4%	2%	3.8	4	0.81
7	Understanding fundamentals of cyber safety/security, as well as media and information literacy	28%	46%	20%	4%	2%	3.94	4	0.91
8	Encouraging accountable usage of different technologies	20%	56%	16%	4%	4%	3.84	4	0.93
9	Maintaining the learning environment clean and orderly for the students	22%	50%	22%	4%	2%	3.86	4	0.88
10	Promoting and implementing rules and regulations for proper computer usage	26%	52%	14%	6%	2%	3.94	4	0.91
11	Reporting malfunctions and problems in computer software and hardware accurately	22%	42%	28%	6%	2%	3.76	4	0.94
12	Helping in minimizing the effects of digital division by providing all students with access to digital materials	22%	44%	24%	8%	2%	3.76	4	0.96
13	Building a sense of belonging in a virtual learning community	18%	58%	20%	2%	2%	3.88	4	0.80
14	Adapting activities for physically challenged pupils through specialized hardware and software	16%	48%	20%	12%	4%	3.6	4	1.03
15	Demonstrating knowledge and skills in processing learning resources using technology tools, as well as rational use of the resources for educational purposes	16%	58%	14%	10%	2%	3.76	4	0.92
16	Supporting students in using digital devices in the classroom, including those with varying skills, ages, genders, and socio-cultural and linguistic backgrounds	22%	58%	12%	8%	0%	3.94	4	0.82
17	Identifying and managing issues regarding internet conduct and safety	22%	50%	22%	6%	0%	3.88	4	0.82
Overall							3.82	4	0.90

Table 2 shows that the participants were good on *understanding ICT concepts and its impact on present society and the entire world* (Mean = 4.06, SD = 0.72) and *demonstrating knowledge and skills in the ethical, legal, and safe use of technology* (Mean = 4, SD = 0.67) as supported by obtained highest mean value and less deviation. Furthermore, the statement *supporting students in using digital devices in the classroom, including those with varying skills, ages, genders, and socio-cultural and linguistic backgrounds* (Mean = 3.94, SD = 0.82) shows the third highest mean followed by *promoting and implementing rules and regulations for proper computer usage* (Mean = 3.94, SD = 0.91), which indicates that the respondents were found good on these statements.

However, statement *differentiating and identifying copyright, and patent of various educational materials/resources* (Mean = 3.46, SD = 0.95), shows the lowest mean value among all these. This statement also perceived as the lowest competency by them. While statement *adapting activities for physically challenged pupils through specialized hardware and software* (Mean = 3.6, SD = 1.03) shows the second lowest mean followed by the statements *understanding the legal implications of software licenses and fair usage* (Mean = 3.7, SD = 0.89) which shows third and fourth lowest mean value, respectively which uncovered that the participants were found good on these statements. Similarly, the participants were found good on *detecting plagiarism in students' work* (Mean = 3.72, SD = 1.09) as evidenced by obtained mean and mode value. Therefore, overall mean value of this dimension (Mean = 3.82, SD = 0.90) indicates that the respondents were found themselves good in almost all the statements of social ICT competencies.

This dimension also comprises one open ended question. In this question the student teachers were asked to write about what kind of capacity building they need in social ICT.

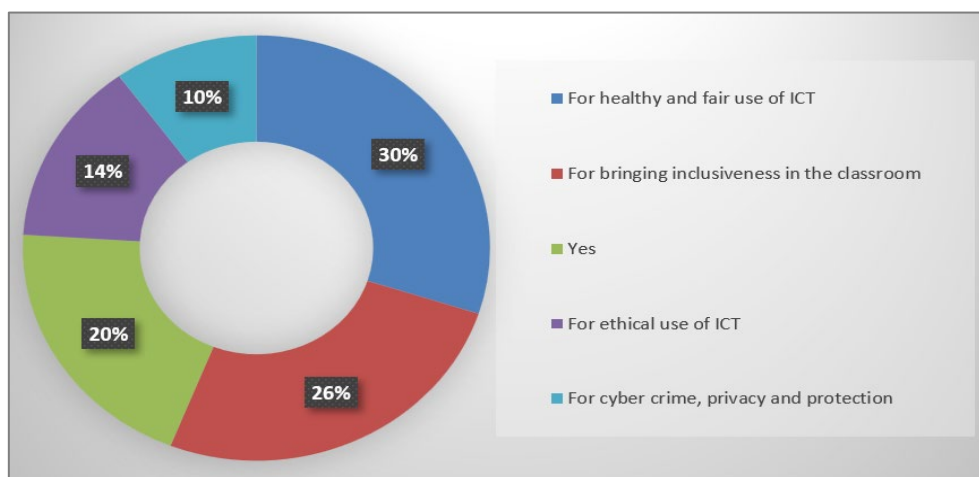


Figure 2: Responses of student teachers about their need for capacity building in social ICT

The presented figure 2 describes that 30% of the respondents reported that they need capacity building for healthy and fair use of ICT. While 26% of the respondents revealed that they need ICT capacity building for bringing inclusion in the classroom. 20% of them responded that they need capacity building in social ICT competencies but, they did not include any specific area. Furthermore, 14% of the respondents claimed that they require capacity building for ethical use of ICT. Whereas only 10% of the respondents indicated that they need ICT capacity building for privacy and protection of data and cybercrime.

DISCUSSION

This study investigated how student teachers perceived their professional and social ICT competencies. Results revealed that 28% of respondents were good in following online tutorials or training programmes (Mean = 3.88, Mode = 4, SD = 1.06), and 38% in Identifying educational websites and portals related to the subject area (Mean = 3.72, SD = 0.95). Therefore, they should be encouraged to use modern or new ICT tools and resources for their professional growth and development. Whereas 38% of student teachers were found less competent in licensing and distributing their original teaching resources as OER (Mean = 2.9, SD = 1.16) as they reported fair on this statement. Hence, teacher educators should motivate and train student teachers to explore the new ICT tools and resources and provide hands-on experience of using them for the growth and development of their profession. Overall findings indicated that most of the respondents (38.43%), were good in almost all the statements of professional ICT competencies as evidenced by the overall mean and mode value (Mean = 3.52, SD = 1.05). These findings are also consistent with Guillo and Guillo (2017) in which they disclosed teachers were very competent in using ICT in activities that promote professional growth and development, innovation, and

collaboration. However, these findings differ from Bingcang's (2014) in which he found that respondents were less competent in using ICT for their professional development.

With regard to social ICT competencies of student teachers, findings revealed that 54% of student teachers were good in understanding ICT concepts and its impact on present society and the entire world (Mean = 4.06, SD = 0.72), 68% in demonstrating knowledge and skills in the ethical, legal, and safe use of technology (Mean = 4, SD = 0.67), and 58% in supporting students in using digital devices in the classroom, including those with varying skills, ages, genders, and socio-cultural and linguistic backgrounds (Mean = 3.94, SD = 0.82). On the other hand, 32% of the student teachers reported that they are fair in differentiating and identifying copyright, and patent of various educational materials/resources (Mean = 3.46, SD = 0.95). This implies that student teachers are less familiar with the copyright issues of different educational materials. Therefore, a workshop or seminar can be organized by teacher educators to provide knowledge and skills of social, ethical, legal, and fair and healthy use of ICT, which will make student teachers competent in social ICT. Overall findings disclosed that the majority of the respondents (51.18%) perceived themselves as good in almost all the statements of social ICT competencies as supported by overall obtained mean value (Mean = 3.82, SD = 0.90). This implies that student teachers are well-versed in social, ethical, and legal aspects of ICT use. These results are in also coherence with the study of Bingcang's (2014) in which participants were found good at using ICT in an ethical and legal way. The same findings were also indicated by Guillo and Guillo (2017), Marcial (2017) in which they discovered that respondents are good in social ICT competencies.

CONCLUSION

In this study, it was found that student teachers have competency in both professional and social ICT as, 38.43% of them reported good in professional ICT competencies, and 51.18% in social ICT competencies. The findings also revealed that among the professional ICT competencies, they were well-versed in following online tutorials or programs and online seminars; they were also good in identifying educational sites and portals and analysing digital teaching resources. However, they indicated less familiarity with licensing and distributing their original teaching resources as OER, designing rubrics to assess student performance, and fostering innovations. Student teachers were also found good in social, ethical, legal, and healthy use of ICT in teaching-learning. They were also good in supporting small groups and individuals irrespective of any discrimination to use digital devices in the classroom. However, 32% of them were found less familiar with the issues of copyright, copyright and fair use of ICT. However, all the student teachers claimed that they want capacity building in professional as well as social ICT that includes online ways of teaching-learning, blended and virtual learning, privacy protection, ethical and fair use of ICT, and inclusiveness in the classroom. This implies that student teachers need to improve their professional and social ICT competencies to become more effective teachers. Therefore, teacher education institutions should facilitate training or hands-on experience to student-teachers in the professional and social use of ICT.

This study also makes some suggestions for future studies:

- This study was confined to professional and social ICT competencies of student teachers; further study can be done on other ICT competencies of student teachers.
- In future, same study can be conducted on in-service teachers.
- A comparative study of ICT competencies can be conducted on the basis of gender, qualifications, institutions, and regions.

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THE ROLE OF AI IN MATHEMATICS EDUCATION: ASSESSING THE EFFECTS OF AN 'AUTO DRAW' WEBTOOL ON MIDDLE-LEVEL ACHIEVEMENT

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ABSTRACT

This study investigates how artificial intelligence (AI) affects middle school students' academic performance. Although AI has the potential to revolutionize education, obstacles including poor data quality and a lack of skilled employees prevent its integration. The study examines the impact of an AI-based web tool called Auto Draw on maths success, identifies integration issues, and establishes the skills required for productive AI use in classrooms using a combination of methodologies. The quantitative research shows that employing Auto Draw has significantly improved students' learning outcomes. The qualitative investigation emphasizes the necessity of teacher preparation programs, and legislative frameworks, and acknowledges AI as a supplementary tool while valuing the human component in education.

INTRODUCTION

Technology has been a key factor in the evolution of humans throughout recorded history, transforming us from cavemen to the technologically dependent people we are today (Smith, 2018). technology has permeated every facet and aspect of our lives, finding applications in a wide range of areas (Payal & Kanvaria, 2018). The internet, which has radically changed communication and information sharing in what is now known as the Information Technology Age, is without a doubt the most important modern development.

We have reached the apex of human technological development in the twenty-first century. Our progress from making tools out of bones and stones to building robots that are capable of thinking and reasoning like humans are best illustrated by the development of driverless cars (Anderson, 2020). Artificial intelligence (AI), which includes cognitive functions like problem-solving, learning, and judgment that are similar to those of the human brain, has permeated every aspect of our daily life. Personalized search engines and location-based suggestions are two examples of AI technologies that impact our behaviour and have the capacity to make complex decisions on our behalf, so influencing our future experiences. We are witnessing the dramatic impact of technology in revolutionizing numerous sectors, with AI already making important contributions to sectors including senior care, retail, and education (West, 2019).

NEED FOR STUDY

Implementation goals, usage contexts, deployment, and the levels of application among persons, institutions, and larger educational networks are just a few of the critical variables that must be taken into account in order to fully realize AI's potential in education. "Learning with AI," "Using AI to learn about learning," and "Preparing for AI" are the four key subcategories of the integration of AI in education (Rawson et al., 2019).

Technology has always been essential to education, enhancing accessibility and fostering more stimulating learning settings (Nath, 2022). Radio and television increased educational options, while the Gutenberg press revolutionized how books might be obtained. The ability for pupils to learn at their own pace thanks to the Internet has further changed education. AI has recently become an effective tool in education, with the potential to improve administrative procedures and instructional techniques.

AI may help with a variety of administrative chores, including course recommendations based on student profiles and student registration. Additionally, it can pinpoint students' weak points and offer specialized assistance. AI may also analyse the demands of the labour market and assist organizations in creating courses that place a strong emphasis on employability. The UN Sustainable Development Goal 4, which aspires to promote high-quality, egalitarian education by utilizing technology, is in line with integrating AI into education.

It's critical to understand cognitive development and the competencies required to use AI in education in order to completely comprehend the impact of AI on student learning results. However, there is little study on how AI affects teaching methods and how it is incorporated into different disciplines (Klutka et al., 2020). The effects of AI-based tools in classrooms on student learning outcomes require more investigation.

AI has had a big impact on education, opening up access and changing the way people study. The adoption of AI in education holds forth hope for improving operational procedures and instructional strategies. Understanding how AI affects students and examining its potential in many academic areas can open up new avenues for a comprehensive and successful educational system.

THE OBJECTIVES OF THE STUDY

As Researcher is seeking to measure the learning achievement of students when they receive instruction from AI tools in the classroom. As a result of this study, we will be able to:

1. Assessing student math learning with AI.
2. Examine teachers' awareness of AI.
3. Identify challenges in AI integration.
4. Determine essential skills for AI implementation.

THE HYPOTHESES OF THE STUDY

Various hypotheses laid down to study the level of achievement in students are as follows:

1. H1: There is no significant difference in the post-test result of the control and experiment groups.

REVIEW OF LITERATURE

The integration of AI in education has garnered significant attention in recent years. The CBSE Academic publication (2018) emphasizes the inclusion of AI as a subject in the secondary school curriculum to equip students with essential AI skills. Jaiswal and Arun (2021) emphasize the transformative potential of AI in providing personalized and inclusive learning experiences that cater to individual student needs. Sandu and Gide (2019) discuss the use of AI-based chatbots in higher education to enhance student support and engagement. Yadav (2020) compares AI-driven virtual learning with traditional classroom learning, highlighting the benefits of personalized instruction and real-time feedback. Kim, Lee, and Cho (2022) explore pedagogical approaches for student-AI collaboration, fostering personalized and interactive learning experiences. Kaviyaraj and Uma (2021) look at the uses of augmented reality and AI in the classroom. Holmes et al.'s (2021) discussion of the ethical issues surrounding AI in education places a focus on the necessity of ethical behavior. Tewari et al. (2020) talk about AI-enhanced sustainable education in India. An adoption paradigm for AI-based chatbots at higher education institutions is presented by Rahim et al. in 2022. In their study of AI's potential in health education, Sousa et al. (2021).

Rane (2023), Celik et al. (2022), Buscher (2020) and Vincent-Lancrin and Van der Vlies (2020) explore the potential of AI in math education, highlighting both its promising benefits like personalized learning and adaptive feedback, as well as potential challenges like ethical considerations and teacher integration. UNESCO report emphasizes the potential of AI to address educational challenges and promote quality learning for all. It provides valuable insights into ethical considerations and responsible AI development in education (UNESCO, 2019). The studies by Park and Baek (2020) and Lagrange, Richard, Velez and Van Vaerenbergh (2023) investigate the impact of dynamic geometry software, another form of technology in math education, on students' spatial reasoning and achievement in geometry. The findings provide valuable comparisons and insights into the potential of AI for similar outcomes. Chiou and Lawson (2015) examine the effectiveness of dynamic geometry software for middle school students' understanding of area and perimeter. While not directly related to "Auto Draw," they provide valuable context for the impact of visual and interactive tools on mathematical learning at this age group. Kanvaria and Suraj (2023) provides an insightful overview of tools in education and management amidst artificial intelligence. Additionally, Kanvaria and Tomar (2023) explore the realm of personalized learning through artificial intelligence. Shulman's framework of pedagogical content knowledge (PCK) (Shulman, 1986) emphasizes the importance of teachers' understanding of both the subject matter and how to effectively teach it. This strengthens the discussion of the role of teachers in effectively integrating technological tool into their pedagogy. Building on Shulman's PCK and Koehler's TPCK framework, Mishra and Koehler (2006) highlights the importance of teachers' understanding of technology to effectively integrate it into their teaching. They stress upon teachers' preparedness and professional development needs for using ICT tool effectively. The studies by Cheng, Lu, Xie and Vongkulluksn (2020) and Ottenbreit-Leftwich, Kopcha and Ertmer (2018) investigate the relationship between teachers' confidence in using ICT tools and student achievement.

The revolutionary potential of AI in pedagogical techniques, student assistance, personalized learning experiences, ethics, sustainability, and health education is generally highlighted by these studies. AI has the potential to improve educational outcomes across a range of educational settings, support inclusivity and personalized learning, and enhance teaching and learning processes.

METHODOLOGY:

Using a Mixed Method approach, the research seeks to investigate how students learn and how they view the role of AI in the learning process. To properly handle the research problem, both qualitative and quantitative methodologies are used.

RESEARCH DESIGN:

For this study, a convergent parallel design was adopted because it enables independent analysis of the research topics before combining the findings. With the use of this approach, it is possible to investigate how students' views towards AI-based tools affect their learning outcomes.

The simultaneous gathering and analysis of qualitative and quantitative data is a component of convergent parallel design. During the interpretation phase, the goal is to synthesise the findings from the two approaches in order to develop a thorough understanding of the research topic.

SAMPLE AND SAMPLING:

In order to choose the study's participants and school, a purposive sampling technique is used. Due to the small number of schools utilizing AI in their teaching processes, a private school was chosen. Using the odd-even method, 70 students are chosen from a group of 152 depending on their performance in prior classes. Due to the small number of schools implementing AI, the perspective of AI among instructors is also evaluated through purposive sampling.

TOOLS OF STUDY:

Tools of all kinds are created to gather data for the investigation. These tools were created with the study process and the necessary data in mind. To ensure unbiased findings, pre- and post-achievement assessments are developed in collaboration with a subject teacher from a different university. A checklist, a semi-structured interview schedule for teachers, focused group discussions (FDG), and other tools are also employed.

PROCEDURE FOR DATA COLLECTION:

A convergent parallel mixed-method design is used in the study. Data that is both quantitative and qualitative is gathered at the same time. Pre-test and post-test achievement tests given to the control group and the intervention group are included in the quantitative data. To ascertain any variations brought about by the use of AI techniques, the same 23-item set of questions is distributed to both groups. The topic instructor in the intervention group uses the offered teaching manual while utilizing AI tools as part of the teaching process.

Utilizing interview schedules and questionnaires, quantitative data also covers gauging how instructors and students feel about the use of AI tools in the teaching-learning process. Focus groups, telephonic semi-structured interviews, and online and in-person questionnaires are all used to obtain qualitative data.

DISCUSSION AND ANALYSIS

QUANTITATIVE ANALYSIS AND FINDING

In this study, the researcher used a paired t-test to analyze the effect of an AI tool called Auto Draw on the achievement scores of sixth-grade children in mathematics. Quantitative data analysis is a crucial part of the research. When comparing two similar groups at different times, such as students in separate classrooms, students taking pre- and post-tests, or people being evaluated before and after an exercise program, the paired t-test is appropriate.

Control		Experimental	
Mean	17	Mean	17.34286
Median	17	Median	18
Mode	15	Mode	19
Standard Deviation	3.580996	Standard Deviation	3.161746
Kurtosis	-0.69928	Kurtosis	-0.46949
Skewness	0.41981	Skewness	-0.28721

Table 1 Descriptive Statistics of Pre-test Achievement Scores of Experimental and Control

Descriptive statistics of the experimental and control groups' pre-test achievement scores. The mean and median scores for both groups were remarkably similar, indicating comparable performance levels prior to the trial.

However, the experimental group's mode value was somewhat higher, indicating that more students in that group received good marks. The kurtosis values revealed slightly right-skewed distributions, although the standard deviation indicated only minor variation in the pre-test scores.

Control		Experimental	
Mean	17.3142857	Mean	18.51429
Median	18	Median	19
Mode	20	Mode	18
Standard Deviation	3.00755352	Standard Deviation	2.737232
Kurtosis	-0.904942	Kurtosis	-0.53598
Skewness	0.0159896	Skewness	-0.29477

Table 2 Descriptive Statistics of Post-test Achievement Scores of Experimental and Control Groups

The post-test achievement scores were analyzed using similar descriptive statistics. In comparison to the control group, the experimental group performed marginally better, as evidenced by higher mean and median scores. The mode values showed minor variations in the proportion of students receiving high scores. The kurtosis values revealed that both groups' distributions were slightly right-skewed, and the standard deviation suggested that there was only minor variation.

Test	Group	No of Student	Mean	Standard Deviation	t' value	Level of Significant
Experimental Group Pre and Post-Test	Pre	35	17.34	2.737	1.798519	Significant
	Post Test	35	18.51	3.008		

Table 3 Comparison of Experimental Group Pre and Post-Test

T-tests were used to assess the significance of the mean differences in pre- and post-test scores between the experimental and control groups. The findings revealed no discernible change in the pre-test scores across the groups. Although there was a substantial difference in the post-test results, which showed that the experimental group had higher accomplishment levels.

QUALITATIVE ANALYSIS AND DISCUSSION

In this study, the researcher gathered information from instructors to investigate their perceptions of, and expectations for, the integration of AI in the educational environment. A number of themes were found, including the fundamental understanding of AI, applications of AI in the classroom, necessary skill sets, perceptions of AI in the workplace, policy and ground reality mismatches, and integration hurdles. Three qualitative research methods were used by the researcher: surveys, focus group talks, and interviews.

The majority of interviewees struggled to adequately explain AI, frequently conflating it with fundamental technological ideas. Only a small percentage of respondents correctly defined AI as robots' ability to simulate human intelligence. Some people suggested social media sites and AI-based testing when questioned about the applications of AI.

Respondents had trouble naming direct applications of AI in the classroom, although they did highlight indirect ones like employing AI-powered tools for creating presentations and language correction software. They emphasized the advantages of these instruments in terms of time savings and skill development, encouraging their usage.

The study investigated the teachers' technological aptitudes as well. While the majority of respondents had a fundamental comprehension of Google Meet and Zoom, many lacked in-depth technical knowledge. They received little instruction in digital technology throughout their teacher training, and some schools' inadequate infrastructure made it difficult for students to acquire their skills.

The way that teachers viewed AI differed. While many acknowledged its importance and ability to revolutionize education, worries regarding job stability were voiced. Respondents acknowledged the possibility of using AI to help with the workload and personalize learning, but they also voiced concern about being replaced by it in activities like appraisal.

Participants called attention to concerns with insufficient infrastructure, poor connectivity, and insufficient funding for education as well as gaps between policy implementation and the reality on the ground. Lack of knowledge, the stigma attached to technology, and the requirement for structural changes in teacher education were all obstacles to the integration of AI.

Participants in the FGD emphasized the need for a better understanding and training in AI, the influence on teacher positions, and the issues coming from the gap between policy and ground reality, which provided additional support for these findings.

The study shed light on teachers' perceptions, barriers, and expectations regarding AI integration in education, emphasizing the importance of addressing skill gaps, infrastructure limitations, and policy implementation challenges.

FINDING AND CONCLUSION

The quantitative findings of the research indicated that the utilization of the AI web-based tool Auto Draw as a teaching aid had a notable positive effect on the learning achievement of students in mathematics. Specifically, there was no significant difference observed in the pre-test scores between the control and experimental groups, suggesting that all students were initially at a similar level. However, there was a significant difference in the post-test scores between the two groups, indicating that the implementation of the AI tool had a positive impact on student achievement. Furthermore, within the experimental group, the post-test scores showed a significant improvement compared to the pre-test scores, indicating that the intervention with the AI tool facilitated better performance in examinations. Conversely, no significant difference was observed in the achievement of the control group between the pre-test and post-test, suggesting that traditional instructional methods did not bring about substantial changes in student achievement.

The research's qualitative findings primarily addressed three goals: the degree of teacher awareness of artificial intelligence (AI), the difficulties in implementing AI in the classroom, and the fundamental skill set required for successfully implementing AI tools in educational settings. The qualitative analysis found that teachers generally had a neutral view about their knowledge of AI, indicating a lack of thorough comprehension of AI ideas and its real-world applications. However, educators admitted that the use of AI-based language tools like Grammarly has increased their productivity. Additionally, they understood how AI could improve lesson planning, cater to the requirements of particular students, and facilitate efficient monitoring and evaluation.

Infrastructure issues including poor internet access and a lack of trustworthy data banks were among the difficulties in integrating AI into the classroom that were discovered. It was also noted that there was no special AI policy for education, highlighting the demand for thorough regulations including ethical and sociological issues. Given the differences in cost and infrastructure across various locations and nations, questions of equity in access to AI education also surfaced. Additional difficulties were recognized, including a lack of qualified AI professionals and probable pushback from educators due to worries about their jobs.

The research found crucial abilities like AI literacy, communication skills, and the inclusion of AI interaction courses in teacher education as part of the skill set needed for successfully implementing AI tools. Teachers showed a desire to learn more about AI and its application in the classroom since they were aware of the possible implications for their profession and the changing nature of education. Although teachers saw AI's potential to revolutionize education favorably, they also expressed scepticism about the technology's drawbacks.

The research demonstrated that the use of the AI web-based tool Auto Draw as a teaching aid positively influenced student achievement in mathematics. The qualitative findings shed light on the level of awareness among teachers, challenges in integrating AI, and the crucial skill set needed for a successful transition to AI tools in the classroom. These insights have implications for educational practice and underscore the potential benefits of integrating AI tools into the curriculum to enhance learning outcomes.

RECOMMENDATION

1. Integrate AI into education: Look into practical ways to use AI tools in the educational system to boost student achievement and the learning process.
2. Promote awareness and training: Through in-service training programs, raise teachers' understanding of AI and its potential in the classroom. To encourage a favorable attitude towards AI integration, address worries and misconceptions.
3. Establish clear AI regulations and guidelines that specify the function of AI in education while taking ethical, sociological, and equity factors into account. Make sure AI is included in a way that benefits society and protects the critical function of human educators.

4. Invest in infrastructure improvements, particularly dependable internet connectivity, to support the use of AI tools in the classroom. To ensure that all students have equal access to technology, address access inequities.
5. Promote research and innovation: Promote the construction of AI research centers that are focused on figuring out how to best apply AI in education. In order to investigate the possible advantages and difficulties of AI integration, encourage continual research and innovation.

These suggestions are meant to encourage the careful incorporation of AI tools into the educational process, making sure that they are used to improve the teaching and learning procedures while taking into account the ethical, social, and practical ramifications. We can maximize the promise of AI in education by embracing it and providing the required infrastructure, support, and knowledge.

CONCLUSION

The effect of AI on middle-level pupils' academic achievement is highlighted in this study. The results highlight AI's potential to revolutionize the learning process while also pointing out integration issues. The study examined the use of the AI-based application Auto Draw in mathematics using a mixed methods approach. Quantitative findings showed a substantial difference in learning accomplishment between the experimental and control groups, illuminating Auto Draw's beneficial effects on students' test scores. The qualitative analysis shed important light on the level of knowledge of AI among teachers, obstacles to its successful integration into the classroom, and necessary skill sets.

The study's conclusions lead to a number of recommendations. Enhancing learning experiences through the use of AI is critical, and teacher education courses must include AI concepts and technologies. Teachers' knowledge and competency in using AI effectively would grow if in-service training were provided. Creating explicit policies for the incorporation of subpar AI is crucial, with an emphasis on AI as a supplementary tool rather than a substitute. Successful AI integration requires infrastructure upgrades, dependable data banks, and enough government financing.

This study highlights the enormous potential of artificial intelligence in education and emphasizes the necessity for proper integration. The guidelines can help educational institutions use AI to improve learning opportunities while preserving the crucial role of human interaction. Learning environments that are more effective and inclusive will result from further investigation and study into AI in education.

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