

**MASSIVE OPEN ONLINE COURSES IN CENTRAL
UNIVERSITIES OF NORTH EAST INDIA: STATUS,
PROBLEMS AND PERCEPTIONS OF STAKEHOLDERS**

**A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

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**MASSIVE OPEN ONLINE COURSES IN CENTRAL UNIVERSITIES OF
NORTH EAST INDIA: STATUS, PROBLEMS AND PERCEPTIONS OF
STAKEHOLDERS**

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Submitted
In partial fulfillment of the requirement of the Degree of Doctor of Philosophy
in Education of Mizoram University, Aizawl.



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CERTIFICATE

This is to certify that the thesis entitled “**Massive Open Online Courses in Central Universities of North East India: Status, Problems and Perceptions of Stakeholders**”, submitted by **LALCHHANHIMI**, Ph.D. Scholar, Department of Education, Mizoram University, **Registration. No. MZU/Ph.D./1602 of 21.10.2020**, for the degree of Doctor of Philosophy in Education of Mizoram University, Aizawl, India embodies the record of original investigations carried out by her under my supervision. She has been duly registered and the thesis presented is worthy of being considered for the award of Ph.D degree. This research work has not been submitted for any degree of any other university.

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DECLARATION
MIZORAM UNIVERSITY
APRIL, 2026

I **LALCHHANHIMI**, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of any previous degree to me or to do the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any research degree in any other University/Institute.

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CHAPTER - I
INTRODUCTION

CHAPTER – I

1.0. Introduction

Education plays a crucial role in reaching life goals in contemporary society. It provides numerous opportunities to advance one's career through the acquisition of knowledge. In broader terms, it is essential for equipping individuals with the necessary skills for a fulfilling life, making it indispensable for those who remain disadvantaged in society. Every individual has a responsibility to ensure inclusive, high-quality education for all, facilitating participation and promoting achievement. Education is a worldwide phenomenon that significantly contributes to both individual and national advancement. It has the power to empower individuals in underprivileged and marginalized situations (Dreze & Sen, 2003). By providing the proper knowledge, skills, and information, quality education can significantly contribute in the holistic development of individuals, families, and communities (Wamboye et al., 2015). Historically, people traveled across continents to acquire knowledge and wisdom due to restricted resources and growth opportunities in their own countries. Upon accomplishing their objectives, they returned to disseminate their knowledge, contributing to the development of a systematic and replicable educational framework accessible to a broader population (Sharma, 2018). Education has continuously progressed from the ancient time to the present day. It is continually experiencing several transformations, particularly due to technological advancements in this digital age.

The educational framework of a nation is pivotal in attaining societal advancement. It determines the future of its citizens. Colleges represent the initial phase of higher education, providing students with opportunity to explore new fields of knowledge and cultivate social awareness and responsibility (Mayhew et al., 2016). The objective of instructing particular subjects is to enhance and develop pupils' learning capabilities. Higher education institutes focus on preparing future educators to teach at primary and secondary levels. Nystrom (2009) asserts that these programmes are designed to cultivate professional competencies in students, equipping them to take on the academic and social responsibilities of shaping and

advancing future professionals in discipline such as science, medicine, research, and engineering. The success of an educational system relies on the teaching skills of instructors, which are developed through teachers training programmes. According to Dash (2000), the efficacy of the education system depends on well-trained and knowledgeable teachers who are intellectually engaged and passionate about their profession. Conversely, if educators are inadequately trained and lack commitment to their roles, the system is likely to falter. Over time, the education system has undergone significant changes, with the current emphasis on lifelong learning being extremely important. Teachers or educators are task not only with imparting knowledge to students but also with elucidating learning theories and fostering their holistic development. The National Knowledge Commission (NKC) (2007) emphasizes the importance of education at the school level in fostering a knowledge-based society. Information and Communication Technologies (ICTs) have significantly transformed the manner in which individuals obtain and disseminate information. They have eliminated the constraints of distance and time, enabling individuals to instantly access knowledge with just a click of a mouse.

The beginning of distance education dates to the mid-19th century in Europe and the United States with the introduction of correspondence courses. These courses became popular as technological advancements enhanced the efficiency of the postal service (Sanzgiri, 2020). The fundamental concept of distance education was to provide learning accessible to individuals marginalized or disadvantaged inside the traditional educational framework. In conventional educational approaches, education is imparted to students within the four walls of the classroom, where learners' knowledge predominantly relies on their teachers' knowledge and proficiency. However, in contemporary society, the emergence of technology and the World Wide Web has rendered online learning a prevalent trend, where independent learning methods are favored and emphasized. This online learning method has simultaneously benefited a diverse array of students worldwide, encourages more student participation due to its learner-centered approach, and provides the opportunity to learn and acquire knowledge at their convenience.

The digital revolution in India is significantly contributing to the nation's advancement and establishing it as a developed economy. Ambadkar (2020a) asserts that this revolution is instigating substantial transformation across multiple sectors, including banking, education, retail, agriculture, healthcare, rural development, and financial inclusion, among others. The digital revolution in India significantly emphasizes higher education with innovative technologies disrupting conventional teaching and learning methodologies. This transition to digitization is facilitating India's emergence as a 'Knowledge Economy' (Ambadkar, 2020b). The emergence of the internet, advancements in information and communication technologies and the globalization of technology have significantly transformed remote education, or online learning, in the dissemination of knowledge and the learning processes of individuals. The emergence of Web 2.0 has provided several online platforms for consumers and profoundly influenced online learning systems. Thus, to comprehend learning in the digital age, enhance the learning environment, and promote interaction and interconnection among diverse participants through online tools, the term "Massive Open Online Course (MOOC)" was introduced (Latha, 2019a). Massive Open Online Courses (MOOCs) are a key driver of technological innovation in education in India. These courses enable thousands of learners to participate simultaneously in free, open courses, irrespective of their geographical location (Ambadkar, 2020a).

1.1. Massive Open Online Courses

A Massive Open Online Course (MOOC) is a web-based platform that enables an unlimited number of students worldwide to access distance education through the collaboration of the world's top institutes (Agrawal & Singh, 2018). It can also be described as an online course available to many participants, accessible to anyone with an internet connection. This online course is open to everyone without entry qualifications and offers a complete course through an online mode (Latha, 2019b).

Agrawal and Singh (2018) have given a comprehensive meaning and definition of MOOC in which 'Massive' refers to large-scale participation of users,

‘Open’ defines courses that are open for all, which may be open access, open syllabi, self-directed and open content learning environments, ‘Online’ which shows that courses are available in online mode via internet and ‘Course’ denotes the structures of courses which are offered online to the participants or the concept of a pedagogically designed to online learning.

MOOC courses have been implemented in different universities within the country. Understanding the status and challenges of MOOC courses is crucial for enhancing the effectiveness of online learning. In India, MOOC courses are offered through the SWAYAM platform, which was launched by the Ministry of Human Resource Development in 2016 and is now managed by the Ministry of Education, Government of India, to integrate Indian higher education, both online and offline (Chauhan & Goel, 2017).

Over the past few years, MOOCs have grown substantially, with the emergence of various MOOC platforms, including prominent ones such as Coursera, edX, XuetangX, FutureLearn, and Udacity (Uppal, 2019). In 2018, over 900 universities collectively provided more than 11,400 courses. Between 2011 and 2018, approximately 101 million individuals worldwide enrolled in at least one MOOC, with 20 million new registrations recorded in 2018 alone. As of January 2019, over 3,400 MOOCs were available (Shah, 2019).

In India, there has been a selection of over 2,000 courses spanning 80,000 hours of learning, taught by over 1300 instructors from 200 Indian universities, ranging from school-level to post-graduate education, accessible through the SWAYAM portal (Uppal, 2019; Class Central, n.d.). This exemplifies the enthusiastic response from both educators and learners to the adoption of MOOC-based learning.

1.2. History of MOOCs

In 2008, Dave Cormier of the University of Prince Edward Island invented MOOCs. He used this term to describe a short course called "Connectivism and Connectivity Knowledge," developed by George Siemens and Steven Downes.

Twenty-five University of Manitoba students were offered the opportunity (Latha, 2019a). This course was also made available to the general public for enrollment. The course drew over 2300 people from all over the world. The Co-creators refer to this course as Connectivist or cMOOC because it focuses on the power of networking with peers using digital platforms such as Wiki and other social media network sites (Latha, 2019b).

The course "Introduction to Artificial Intelligence" has garnered over 160,000 students globally, but only 20,000 individuals have completed it among millions who have taken it (Latha, 2019b; Malliga, 2013; Sanzgiri, 2020). The initial Connectivist MOOCs were credit-based, institutional courses that were made available to the public at no cost. Students interacted with each other and exchanged information through blogs and web pages, aligning with the tradition of self-directed learning in distance education.

In 2011, Stanford University introduced computer science, database introduction, and machine learning courses through Extended Massive Open Online Courses (xMOOC) to reach a broad audience. While the courses prioritized accessibility, there was less emphasis on learner engagement. The courses gained immense popularity, leading to a surge in research for developing MOOC Platforms that could offer a variety of courses. Professors Andrew Ng and Daphne Koller, who co-created the computer science course, were inspired by its success in building a platform called Coursera, which is now an independent entity separate from Stanford University (Sanzgiri, 2020). The number of MOOC organizations, linked institutions, and MOOC courses is predicted to grow over the next 12 months. The New York Times, media professionals, and educators have even declared 2012 the year of the MOOC (Latha, 2019b; Malliga, 2013).

1.3. Types of MOOCs

Massive Open Online Courses (MOOCs) have gained significant popularity in recent years, with various models emerging and evolving rapidly. These models offer a range of roles for educators and can be classified into three categories: xMOOCs, cMOOCs, and quasi-MOOCs, as defined by Siemens in 2005. Each

category has unique characteristics and benefits, making MOOCs a versatile and effective tool for learning and education. The different models or types of MOOCs may further be explained as follows:

A.) cMOOCs:

This type of MOOC model is known as the Connectivist MOOC, which was based on Siemens' theory of connectivism, where all the learners or participants can connect and collaborate with their peers, experts, professionals, academicians, and knowledge resources through digital networks to learn (Papathoma, 2018). cMOOCs emphasize the importance of learners' autonomy and the learning goals, which the learner rather than the instructor defines. They can choose their preferred technologies, with open and ill-defined learning pathways (Littlejohn, 2013). According to Papathoma (2018), in connectivist massive open online courses (cMOOCs), the learners initiate interactions and prioritize teaching and learning. This approach to online education emphasizes the importance of collaborative learning and active participation among learners.

B.) xMOOCs:

This type of MOOC is a content-based online course in which an instructivist design is employed where the instructor predefined the learning goals, the environment structures the learning process, and there are limited interactions among the learners (Littlejohn, 2013). Teachers are considered 'experts,' and learners are mainly 'knowledge consumers.' In this model, learning is primarily a process of acquiring the knowledge structure of the learner, which is set by the course designer or the instructor (Siemens, 2005). xMOOCs include courses that are structured more conventionally and are offered and delivered through not only simple web platforms but also through the learning management platforms of institutions or individual academics (Baturay, 2015).

C.) Quasi-MOOCs:

This type of MOOC model provides web-based tutorials, such as open online resources, to support specific learning tasks, which are considered asynchronous

learning resources. In quasi-MOOCs, there is no social interaction among learners and educators seen in cMOOCs, and the automated grading and tutorial-driven format of xMOOCs are also not offered in this type of MOOC model (Siemens, 2005). These open online resources are not packaged as a course and are available for learners to use unrestrictedly.

1.4. Popular MOOC platforms of other countries:

In recent years, the rise of Massive Open Online Courses (MOOCs) has transformed the global education landscape. MOOCs have made quality education accessible to anyone with an internet connection, breaking the traditional barriers of time, cost, and geography. Among the numerous MOOC providers worldwide, six platforms namely: Udemy, Udacity, OpenLearn, Coursera, FutureLearn, and edX stand out for their reach, innovation, and contribution to lifelong learning.

1. Udemy

Founded in 2010 in the United States, Udemy is one of the largest online learning marketplaces in the world. Unlike many academic-oriented MOOC platforms, Udemy allows independent instructors to create and sell their own courses. This makes it a highly diverse platform, offering over 200,000 courses on topics ranging from business and technology to art and personal development (Udemy, 2024). Learners can study at their own pace, and the platform offers lifetime access to purchased courses. Udemy's strength lies in its practical, skills-based content that appeals to both professionals and hobbyists.

2. Udacity

Udacity, also based in the U.S., was launched in 2011 as an educational venture offering university-style courses online. Over time, it evolved into a specialized platform focusing on technology and career-oriented education, particularly in areas like data science, artificial intelligence, cloud computing, and programming (Udacity, 2024). Udacity is best known for its "Nanodegree" programs, developed in partnership with leading tech companies such as Google,

Amazon, and IBM. These programs are designed to prepare learners for high-demand jobs by combining theory with hands-on projects and mentorship.

3. OpenLearn

OpenLearn is a free learning platform launched by The Open University (UK) in 2006. It offers thousands of free courses, articles, and videos covering a wide range of subjects, including science, education, history, and health (OpenLearn, 2024). OpenLearn is unique because it serves as both a gateway to formal education and a community resource for lifelong learning. Learners receive free digital badges and statements of participation, which can be added to résumés or LinkedIn profiles. Its open-access philosophy reflects The Open University's mission to make learning available to everyone, regardless of background.

4. Coursera

Founded in 2012 by two Stanford University professors, Coursera is among the most recognized MOOC platforms globally. It partners with more than 275 universities and organizations, including Yale, Google, and the University of London, to provide world-class courses, professional certificates, and even full degree programs (Coursera, 2024). Coursera's flexible learning options such as guided projects, specializations, and online degrees have attracted millions of learners worldwide. Its blend of academic rigor and professional relevance makes it one of the most trusted platforms for both individual and institutional learning.

5. FutureLearn

FutureLearn, launched in 2013 and based in the United Kingdom, is another major MOOC provider. It was founded by The Open University in partnership with several prestigious UK and international universities (FutureLearn, 2024). FutureLearn focuses on collaboration and social learning, encouraging learners to discuss and share ideas throughout the course. The platform offers short courses, micro-credentials, and degree programs in various disciplines, including business, healthcare, and education. Its user-friendly interface and discussion-based model make it particularly engaging for learners seeking interaction and community.

6. edX

edX was created in 2012 by Harvard University and the Massachusetts Institute of Technology (MIT) as a non-profit platform to promote open and accessible education. It offers courses from top universities and institutions worldwide, covering fields such as computer science, engineering, humanities, and public health. edX provides MicroMasters, Professional Certificates, and even fully online master's degrees (edX, 2024). In 2021, edX was acquired by 2U, Inc., but continues its mission to expand access to high-quality education globally. Its emphasis on academic excellence and research-driven learning sets it apart from more commercial MOOC providers.

7. MIT OpenCourseWare (OCW)

MIT OpenCourseWare (OCW), launched in 2001 by the Massachusetts Institute of Technology (MIT), is one of the earliest and most influential open education initiatives. Unlike traditional MOOCs, OCW provides free access to complete course materials from nearly all MIT courses, including lecture notes, assignments, exams, and video lectures (MIT OpenCourseWare, 2024). It does not require registration and does not offer certificates, focusing instead on knowledge sharing and academic transparency. MIT OCW has inspired many later MOOC platforms and remains a pioneering example of open-access higher education.

8. XuetangX

XuetangX, launched in 2013 by Tsinghua University in China, is the first and one of the largest MOOC platforms in the country (XuetangX, 2024). It operates on edX's open-source platform (Open edX) and offers thousands of courses in both Chinese and English. XuetangX collaborates with numerous universities and enterprises to provide high-quality online learning opportunities. The platform offers credit-bearing courses, micro-degrees, and corporate training programs, playing a key role in China's national strategy for digital education and lifelong learning. It reflects the growing influence of MOOCs in Asia and demonstrates the globalization of online learning.

Platforms such as Udemy, Udacity, OpenLearn, Coursera, FutureLearn, edX, MIT OpenCourseWare, and XuetangX have collectively reshaped global education. Each platform contributes uniquely, Udemy and Udacity with skill-based training, OpenLearn and MIT OpenCourseWare with free open resources, Coursera and edX with university collaborations, FutureLearn with social learning, and XuetangX with localized yet globally oriented content. Together, these MOOC platforms represent a powerful movement toward inclusive, flexible, and lifelong learning, empowering millions worldwide to pursue education beyond traditional boundaries.

1.5. Popular MOOC Platforms in India

MOOC is the most used online course in India and globally. There has been tremendous growth in the enrollment of MOOCs by Indian students worldwide, and studies have also shown that India is among the leading countries in terms of enrollment in MOOC courses offered by various providers or platforms, such as edX, Coursera, and Udacity (Chauhan & Goel, 2017). The government of India has taken numerous initiatives to provide and support open education, to make open resources available in various forms, including educational media files, libraries, and e-books. According to a study by Chauhan and Goel (2017), several initiatives have been introduced in India to promote open education and utilize information technology for the dissemination of educational knowledge. These included the Education and Research Network (ERNET), EDUSAT - a satellite explicitly launched for educational purposes, the Consortium for Educational Communication (CEC), and the Information and Library Network Centre (INFLIBNET). These initiatives aimed to make education accessible to all. The concept of online courses was introduced, and the Indian government set out to offer online courses by developing its platforms. So, MOOCs are an eminent alternative for Indian learners to access higher education and improve the quality of education through online learning. Some of the popular platforms that are presently used in India are as follows:

1.) NPTEL:

The National Programme on Technology Enhanced Learning (NPTEL) project was initiated in 2003 and funded by the Ministry of Human Resource

Development. NPTEL has now started offering online courses using open-source technology in computer science, management, humanities, electrical and mechanical engineering, music, and other fields, and is a joint initiative of seven Indian Institutes of Technology and the Indian Institute of Science (Chauhan & Goel, 2017).

These course contents are primarily presented in video lectures prepared in a conventional classroom setting, and accompanying slides are also provided to share the course material. NPTEL offers more than 2,300 courses (Class Central, 2023) and currently provides over 600 courses for certification every semester in approximately 22 disciplines (National Programme on Technology Enhanced Learning [NPTEL], 2022). NPTEL aims to operate like MOOC providers by offering new courses, including lectures, assignments, and tests.

2.) mooKIT:

The Indian Institute of Kanpur (IITK) built a lightweight MOOC management system called mooKIT in 2014 through the use of open-source technologies, which is a powerful system to offer online courses at any scale from micro to massive (Chauhan & Goel, 2017). This mooKIT has been designed to offer the connectivist MOOC, i.e., cMOOCs. It has been specifically designed to solve problems such as low-bandwidth and low-computing power situations by providing an indicator of bandwidth connection, similar to a mobile phone's signal strength. This visually indicates the learner's connectivity strength, whether good or bad. Thus, learners can utilize other content delivery options provided by mooKIT. This platform is accessible to all learners and particularly helpful for those from rural areas who may not have access to a smartphone, computer, laptop, or internet connectivity. The mooKIT feature allows learners to receive phone calls and listen to audio even with low bandwidth.

3.) IITBombayX:

This is a non-profit MOOC platform that offers courses on different subjects from multiple disciplines using an open-source platform, i.e., Open edX, which was developed by IIT Bombay in 2014. IIT-Bombay, a renowned educational institution,

has its own MOOC platform called IIT-BombayX. The platform offers a diverse range of MOOCs to cater to the learning needs of different groups of learners. These MOOCs include EduMOOCs for engineering students, SkillMOOCs for professional development, TeachMOOCs for training teachers, and LifeMOOCs for lifelong learners (Sanzgiri, 2020).

Additionally, the platform helps address challenges in the Indian higher education system by training teachers on using MOOCs in a blended format at their institutions. This initiative benefits the learners and promotes the development of the education sector in India. The National Mission on Education funded it through the Information and Communication Technology (NME-ICT) initiative, the Ministry of Education, and the Government of India (Chauhan & Goel, 2017). IIT-BombayX is a basic version of blended learning MOOC, combining face-to-face learning and online education methods, with course completion being compulsory. The system of this platform enables primary universities in India to offer MOOCs to local Indian college students.

4.) SWAYAM:

SWAYAM, an acronym for Study Webs of Active Learning for Young Aspiring Minds, is an integrated web-based platform for providing MOOCs courses to provide distance education that aimed at offering all the courses from secondary education (Class-IX) to a higher level of education which can be accessed by anyone, anywhere at any time (Anand, 2020). It is a program initiated by the Government of India. It is designed to achieve the three main principles of Education Policy: access, equity, and quality (Study Webs of Active Learning for Young Aspiring Minds [SWAYAM], 2023).

In September 2014, the SWAYAM MOOC platform was introduced through a partnership between the Government-run IITs and various national-level colleges. The platform aimed to provide courses from elite Indian universities in regional languages to accommodate learners who do not speak English (Sanzgiri, 2020).

Despite initial delays, the SWAYAM platform was eventually launched in 2017 and currently offers over 2850 courses (Class Central, 2023), ranging from High School to postgraduate level courses. SWAYAM has helped many students access online courses taught by experts, providing them with high-quality reading resources and engaging them in discussion forums and tests, ultimately helping them earn academic grades. Courses provided through the SWAYAM platform are offered at no cost, and credit mobility has been incorporated in all universities as per the UGC Regulations issued in 2016, allowing credits to be transferred to students' academic records on SWAYAM (Sanzgiri, 2020).

1.6. History of SWAYAM-MOOCs in India

The SWAYAM portal was officially launched on July 9, 2017, to provide free online education resources to learners across India, dating back to 2014 (Ministry of Human Resource Development, Government of India, 2017). On 7th February 2014, Prime Minister Narendra Modi articulated his vision for Digital India via video conferencing during the India Digital Summit (Prime Minister's Office, Government of India, 2014). He emphasized the need for a digitally empowered India where all citizens can access digital services, knowledge, and information. An integral part of this vision was to ensure that "Quality Education reaches the most inaccessible corners driven by Digital Learning" (Ambadkar, 2020). The Digital India Initiative, launched on July 1, 2015, aimed to provide various digital services, including the establishment of a Massive Open Online Course Platform (MOOC) for India, known as SWAYAM. The Ministry of Human Resource Development (MHRD) aspired to utilize the SWAYAM portal to provide online education to even the most remote areas of India via computers, laptops, tablets, and mobile phone apps with internet connectivity (Ambadkar, 2020).

On July 9, 2017, the President of India, Shri Pranab Mukherjee, formally launched the SWAYAM portal, along with 32 SWAYAM Prabha DTH Channels and the National Academic Depository. SWAYAM, an Indigenous platform developed by MHRD, which is the Ministry of Education as of today, and the All-India Council for Technical Education (AICTE), with the assistance of Microsoft,

was designed to host nearly 2,000 courses and 80,000 learning hours for students at various education levels (Ambadkar, 2020; Gohain, 2017; Ministry of Education, Government of India, 2017). Gohain (2017) described it as a 'Made in India' IT platform; SWAYAM could cater to participants from Class IX to post-graduation, providing access to educational resources anytime and anywhere (as cited in Ambadkar, 2020).

A report from the Press Information Bureau of the Government of India, dated December 31, 2018, stated that the Ministry of Education had been working to align courses on the SWAYAM portal with university curricula. To date, 92 universities have accepted credit transfer for courses completed through the SWAYAM Platform. Additionally, as of January 11, 2019, the Press Information Bureau of the Government of India reported that more than 72 lakh learners had registered for various MOOCs administered through SWAYAM, with almost 2 lakh learners having completed the courses (as cited in Ambadkar, 2020).

1.7. National Coordinators of SWAYAM-MOOCs:

SWAYAM's initiative to utilize various audio, video, and mixed media technologies enhances the learning experience, making it more engaging and effective for students across different educational levels. The platform's diverse range of free courses is designed to cater to the educational needs of learners at various stages, from school to postgraduate levels. The roles and responsibilities of the ten National Co-ordinators appointed for the development of SWAYAM are highlighted as follows:

- 1. AICTE (All India Council for Technical Education)** provides self-paced and international courses. It ensures that flexible learning options make technical and professional education available. This allows students to learn at their own pace and gain exposure to global educational content.
- 2. NPTEL (National Programme on Technology Enhanced Learning)** offers courses primarily for engineering. It specializes in creating high-quality

online engineering and technical education courses developed by India's premier engineering institutions, such as the IITs and IISc.

3. **UGC (University Grants Commission)** focuses on non-technical post-graduation education. It provides courses for post-graduate students in various non-technical disciplines, ensuring the availability of advanced education in arts, sciences, and humanities.
4. **CEC (Consortium for Educational Communication)** is dedicated to undergraduate education. It develops and delivers undergraduate-level courses across a broad range of subjects, making higher education more accessible to a larger student population.
5. **NCERT (National Council of Educational Research and Training)** offers resources for school education. It provides comprehensive educational materials and courses for school students, helping to standardize and improve the quality of school education across India.
6. **NIOS (National Institute of Open Schooling)** provides resources for school education. It specializes in open schooling, offering flexible learning opportunities for school students, including those who may not be part of the formal education system.
7. **IGNOU (Indira Gandhi National Open University)** offers programs for out-of-school students. It provides a range of educational programs aimed at school students, emphasizing open and distance learning methods.
8. **IIMB (Indian Institute of Management Bangalore)** is known for its management studies programs. It offers management and business studies courses, leveraging the expertise of one of India's leading business schools to provide high-quality management education.
9. **NITTTR (National Institute of Technical Teachers Training and Research)** provides teacher training programs. It specializes in teacher

professional development and training, ensuring that educators are equipped with the latest teaching methodologies and technological skills.

10. INI (Institutes of National Importance) provides non-technical courses covering disciplines such as management, humanities, social sciences, architecture, and design, reflecting the academic landscape and societal needs.

By leveraging these technologies and the expertise of the National Coordinators, SWAYAM aims to democratize education, making high-quality learning resources available to all students regardless of their location or socio-economic background.

1.8. UGC Regulations towards Implementation of MOOCs in Universities:

The University Grants Commission is committed to creating a content delivery mechanism that caters to students' learning needs and ensures smooth knowledge transfer across geographical boundaries. To achieve this, traditional teaching methods must be integrated with the anytime-anywhere format of e-learning. The Commission has established a regulatory mechanism that enables a seamless connection between online learning and regular classroom learning, as outlined in the UGC (Credit Framework for Online Learning Courses through SWAYAM) Regulation, 2016.

The UGC (Credit Framework for Online Learning Courses through SWAYAM) Regulation 2016 stipulates that online learning courses will be made available through the SWAYAM platform. The platform will notify all institution registrars twice a year, on June 1st and November 1st, of the list of online learning courses offered in the forthcoming semester. Within four weeks of notification, all institutions must consider the online learning courses offered through the SWAYAM platform in their academic requirements. They will then decide on the courses for which they will authorize credit transfer. However, an institution can only offer a maximum of 20% of the total courses in a particular program through online learning courses provided by the SWAYAM platform in a given semester. The parent

institution must assign the same credit weightage to students for credits earned through online learning courses on the SWAYAM platform as they would for credits earned through traditional courses in the program's credit plan. Furthermore, no university should deny credit mobility to students for courses completed through MOOCs.

However, in an official notification, The Gazette of India, dated 24th March 2021, the University Grants Commission (UGC), exercising the powers conferred by the University Grants Commission Act, 1956 (3 of 1956), announced new regulations to replace the existing UGC (Credit Framework for Online Learning Courses through SWAYAM) Regulations, 2016. These new regulations take effect immediately and supersede the previous regulations, except for any actions taken or omitted prior to the implementation of the new regulations. The University Grants Commission (Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds) Regulations, 2021 are a set of guidelines that define the scope of online learning courses offered through the Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) platform. These regulations apply to all universities established or incorporated by or under a Central Act, a Provincial Act, or a State Act, as well as to institutions or colleges recognized by or affiliated with such universities. Additionally, they apply to institutions deemed to be universities under Section 3 of the University Grants Commission Act, 1956. They also apply to transfer credits of students enrolled in any higher education institution in India.

The schedule of the SWAYAM-based online credit courses is aligned with the conventional education semester, which commences in January and July of every year. All higher education institutions must consider the online learning courses offered through the SWAYAM platform within four weeks from the date of notification of the SWAYAM-based online credit courses. The Academic Council or the Autonomous Institution should decide upon the courses they will permit for credit transfer, considering their academic requirements.

Notwithstanding anything contained in sub-regulation (6), higher education institutions may offer up to forty percent of the total courses in a particular program for a semester through online credit courses and the SWAYAM platform. The academic council may expedite the credit transfer earned by the student at their parent institution.

The Indian government has made it mandatory for all higher education institutions to adopt and incorporate the Credit Mobility and Amendments provisions into their rules and regulations, ensuring seamless integration through SWAYAM-based online courses. According to the regulations, the parent institution must assign equivalent credit weightage to the student for the credits earned through online learning credit courses offered via the SWAYAM platform. The credits earned through the SWAYAM platform should be included in the program's credit plan, and no university should refuse credit to any student for courses completed through this platform. To ensure seamless integration, every higher education institution must make the necessary amendments within four weeks from the publication date of these regulations in the Official Gazette in their statutes, ordinances, and regulations.

1.9. The Present scenario of ICT in North East India:

Globally, information and communication technology, or ICT, is now a key factor in the advancement of business, governance, education, and social interaction. ICT is progressively changing the social and economic scene of the eight states that make up the northeastern part of India: Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. The region is experiencing a gradual integration of digital technologies across multiple industries, despite its geographical remoteness and infrastructure limitations (Department of Telecommunications, 2023).

ICT has started to change how people teach and learn in the sphere of education. Digital classrooms, smart boards, and online learning platforms like SWAYAM, DIKSHA, and MOOCs are being adopted by schools, colleges, and institutions in the region more and more. These resources proved invaluable during the COVID-19 outbreak, enabling educational institutions to continue offering

virtual instruction. However, because of erratic internet connectivity and a lack of digital devices, access gaps between urban and rural areas still exist (Ministry of Education, 2022).

In terms of administration and governance, the Digital India program has expedited e-government services in Northeast India. A number of governments have put in place digital platforms for public services, such as digital payment systems, online land records, and e-district. For example, digital service centres have been established in Assam and Tripura to increase rural residents' access to government programs. However, insufficient ICT infrastructure and low levels of digital literacy frequently prevent the full benefits of e-governance from being realised (National Informatics Centre, 2023).

ICT has created new opportunities for e-commerce, digital marketing, and entrepreneurship in the economic sector. The expansion of social media platforms and mobile connectivity has made it possible for local artists and small enterprises to reach a larger audience. Additionally, use of the Unified Payments Interface (UPI) and digital banking has increased financial inclusion, especially for young people. Strengthening cybersecurity, enhancing network dependability, and guaranteeing fair access to digital tools are still difficult tasks (NITI Aayog, 2023).

With the growth of 4G networks and the continuous introduction of 5G connectivity in certain metropolitan areas, the telecommunications industry has experienced tremendous advancement. In order to expand the reach of ICT services, the BharatNet initiative also sought to connect distant communities via broadband networks. Notwithstanding these developments, reliable service delivery is still hampered by steep terrain, frequent power outages, and a shortage of technical personnel (Telecom Regulatory Authority of India, 2024).

North East India's current ICT situation combines advancements with enduring difficulties. Even while education, government, and business are all experiencing a digital transition, rural and urban areas continue to be divided by the digital divide. To fully realise the potential, it will be essential to improve digital literacy, fortify ICT infrastructure, and make sure equitable policies are in place.

1.10. Advantages and Disadvantages of MOOCs:

The benefits of Massive Open Online Courses (MOOCs) have been extensively explored in recent years. Agrawal and Singh (2018) have identified several primary advantages of these courses. MOOCs offer learners the convenience of learning at their own pace and according to their schedule while providing access to high-quality educational resources and instructors who are experts in their fields. Additionally, MOOCs are cost-effective and can be accessed from anywhere in the world, making education more accessible to a broader audience. These advantages make MOOCs a valuable tool for personal and professional development and their popularity continues to grow.

1. Many students can learn from world-renowned instructors while enjoying the comfort of their homes and connecting with like-minded individuals worldwide.
2. Students can explore topics that interest them and access them in any Indian language that suits their convenience, allowing them to read, see, or hear them as many times as they need.
3. Recent surveys conducted by the International Data Corporation (IDC) show that India has a thriving smartphone market in the Asia-Pacific region, making online courses accessible to students with ease through MOOCs.
4. MOOCs offer a cost-free alternative to traditional education, making it more accessible to students.
5. MOOCs provide an excellent foundation for quality education, emphasizing certification and quality assessment, which can benefit students long-term.
6. MOOCs can significantly transform the educational landscape in India, particularly in semi-urban and rural areas. Digital India can facilitate access to educational content in the gram panchayats nationwide.

Regarding the challenges or issues concerning massive open online courses, it can be argued that while MOOCs cannot wholly replace conventional classroom instruction, they can serve as an alternative means of bridging the gap between

different subjects across disciplines. The following list of MOOC limitations is provided:

1. Access to high-speed internet is crucial for viewing MOOC course materials. However, in developing nations like India, the Internet and computers are not readily available, especially in rural areas. As a result, the widespread adoption of MOOCs has been hindered by the lack of necessary infrastructure. To make MOOCs accessible to people with low incomes in India, efforts must be made to minimize the cost of providing high-speed internet access to the country's population.
2. Providing MOOCs involves significant expenses such as infrastructure, platforms, content creation, and human resources. Due to limited capital investment, it is difficult for a single institution to bear such costs in India. Authorities with the ability to fund such initiatives need to get involved. The Indian government must promote public-private partnerships and loosen traditional rules and limitations to foster the development of MOOCs.
3. Many candidates hesitate to enroll in MOOCs because not all courses guarantee degrees, certificates, or diplomas. This makes it challenging for candidates to demonstrate their educational achievements to potential employers.
4. Because MOOCs are web-based, candidates and students are not monitored, which increases the risk of plagiarism and cheating.

Furthermore, MOOCs do not provide opportunities for interaction with the outside world, which limits students' experiences.

1.11. Rationale of the Study

Following the mainstream popularization of MOOCs in 2012, there has been tremendous growth, with thousands of universities across the country offering massive open online courses. Millions of learners from around the globe were attracted by the promise of a free, high-quality educational experience from some of

the world's leading universities (Schmid et al., 2015). A massive open online course (MOOC) is an online course that focuses on unlimited learner participation to assess learning through an open online mode. MOOCs continually focus on open access features, such as open licensing of content, structure, and learning goals, to develop and promote the reuse and remixing of learning resources while providing free access for the students. MOOCs are a progressive model that delivers learning content to anyone who wants to take courses online, with no attendance limits. However, as research on MOOCs begins to grow, evidence suggests that they are potentially intensified and enrich rather than widening access to education, and may not necessarily be making the most of the population of learners who are short of access to higher education (Schmid et al., 2015; Chen et al., 2015). The need for research into Indian MOOC learners became influential and necessary as this study progressed, as, in 2016, the Indian government announced a framework for formal credentialing through MOOCs on SWAYAM and NPTEL that allows learners to complete 20% of their total credit towards any degree through MOOCs from universities across India (University Grants Commission, 2016).

However, in an official notification, the University Grants Commission (UGC), exercising the powers conferred by the University Grants Commission Act, 1956 (3 of 1956), has announced new regulations to replace the existing UGC (*Credit Framework for Online Learning Courses through SWAYAM*) Regulations, 2016. The University Grants Commission (*Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds*) Regulations, 2021, permit a maximum of 40% of the total courses offered in a particular program in a semester to be delivered online through the SWAYAM platform as credit courses.

Through the '*Credit Framework for Online Learning Courses through SWAYAM*' Regulations passed in 2016 and the new Regulations of 2021, the University Grants Commission (UGC) has instructed universities to make amendments in their Ordinances, Rules, Regulations, etc. to incorporate provisions for credit mobility and recognition for Seamless Integrations of Massive Open Online Courses (MOOCs) offered through the SWAYAM platform. As instructed by

the UGC, MOOCs provide knowledge to students who may not have access to higher education and help learners who cannot afford the costs associated with higher education. So, MOOCs are a valuable form of online learning that complements the country's traditional university learning. It is essential to determine whether the country's universities have adhered to the ordinances, rules, and regulations established by the UGC when offering Massive Open Online Courses (MOOCs).

The researcher has analyzed 69 empirical and conceptual studies over a period of 14 years (2010-2024), examining various dimensions of Massive Open Online Courses (MOOCs), including both international and Indian studies. These studies examine several aspects, including the theoretical foundations of MOOCs, pedagogical and technological challenges, perspectives of learners and instructors, institutional readiness, and the evolving opportunities in online and blended learning environments. The Indian higher education has focused on national digital learning initiatives such as SWAYAM, NPTEL, and several e-learning platforms designed to democratize access to quality education.

Despite this growing body of research, there remains a need to understand the current status, implementation barriers, and contextual challenges encountered by various stakeholders including teachers, students, and administrators, particularly within higher education institutions in the North Eastern region of India. The distinct socio-cultural, infrastructural, and digital disparities in this region require a targeted investigation to obtain accurate insights into the perception, adoption, and sustainability of MOOCs within central universities.

Therefore, this study aims to examine the current status of MOOCs, identify challenges encountered by stakeholders, and analyze their perceptions toward online learning in the context of central universities in North East India. The findings aim to provide significant recommendations for improving the design, accessibility, and effectiveness of MOOCs within the Indian higher education framework, thus advancing the national vision of inclusive and technology-oriented education.

1.12. Research Questions

1. What has been the development of MOOCs in the central universities of North East India?
2. What plans and programs have been developed for implementing MOOCs in the central universities of North East India?
3. What are the issues with MOOC design, development, and implementation in the central universities of North East India?
4. What are the perceptions of university students towards learning through MOOCs?
5. Is there any difference in university students' perceptions of learning through MOOCs regarding streams of study and gender?
6. What are the perceptions of university teachers on the pedagogy and learning design of MOOCs?
7. Is there any difference in the perceptions of university teachers on the pedagogy and learning design of MOOCs concerning the streams of study, gender, and teaching experience?

1.13. Statement of the Problem

To answer the above questions, the study had been titled as, **“Massive Open Online Courses in Central Universities of North East India: Status, Problems and Perceptions of Stakeholders.”**

1.14. Objectives of the Study

1. To assess the status of MOOCs in central universities of North East India.
2. To examine the plans and programmes formulated by the central universities of North East India to implement MOOCs in their university.

3. To reveal issues in connection with the design, development, and implementation of MOOCs in central universities of North East India.
4. To assess university students' perceptions of learning through MOOCs.
5. To compare university students' perceptions of learning through MOOCs with respect to gender and streams of study.
6. To assess the perceptions of university teachers of central universities of North East India on MOOCs' pedagogy and learning design.
7. To compare university teachers' perceptions of MOOCs' pedagogy and learning design with respect to gender, streams of study, and teaching experiences.
8. To suggest measures for better implementation of MOOCs in the central universities of North East India.

1.15. Operational Definition of Key Term Used

MOOC: In this study, MOOC refers to Massive Open Online Courses which are offered through the SWAYAM platform, launched by the Ministry of Education and the Government of India.

Stakeholders: In this study, stakeholders refer to the post-graduate students and teachers of the central universities of North East India.

Streams of Study: In this study, the streams of study include the arts and sciences streams.

Teaching Experience: In this study, the teaching experiences of the teacher were categorized into (i) above ten years, and (ii) below ten years

1.16. Delimitation of the Study

In the 2022-23 UGC-Report, it had been notified that there were eleven (11) central universities in the North Eastern India. Among these, the nine general central universities were under the Ministry of Education, Government of India and the other

two were governed under other ministries. The study had been delimited to four central universities of North East India from the nine general universities under the Ministry of Education, Government of India. Thus, the four central universities of North East India in this study included Mizoram University (Mizoram), North Eastern Hill University (Meghalaya), Manipur University (Manipur), and Nagaland University (Nagaland).

CHAPTER – II
REVIEW OF RELATED LITERATURE

CHAPTER – II

2.0. REVIEW OF RELATED LITERATURE

This chapter explores the diverse perspectives of scholars on massive open online courses, the opportunities they present, and the challenges they pose in the online teaching and learning process. Therefore, to gain a broader perspective and better understand the subject, a thorough literature review is necessary to analyze the findings of other academic researchers, draw decisive conclusions, and support the study, ultimately arriving at a meaningful conclusion. A literature review provides rich insight into the research techniques and helps avoid duplication of efforts in particular areas. It is helpful to present research conducted on the topic by other researchers, as well as the ideas and concepts established in their studies. It also provides the reader with a relevant context and perspective for investigating the research subject and linking it to previous studies. This chapter presents the findings and studies conducted by other academic researchers on massive open online courses. This will help readers gain knowledge of the field and serve as a roadmap for future research.

2.1. Review of Literature on Massive Open Online Courses

To conduct the current study, the researcher reviewed numerous studies conducted by scholars, academicians, educational experts, and professionals from India and around the world. These studies focus on the status, issues, challenges, and perceptions related to Massive Open Online Courses (MOOCs) pertinent to the research topic. A list of these studies is presented below:

McAuley, Stewart, Siemens, and Cormier (2010) conducted a study on, "The MOOC model for digital practice," offering an innovative examination of Massive Open Online Courses (MOOCs) as a revolutionary framework for digital learning and practice in higher education. The research seeks to conceptualize and describe the MOOC paradigm, analyze its essential components, and explore its potential implications for teaching, learning, and collaboration in the digital age. This paper conducts a critical analysis of the emerging MOOC phenomenon, the study identifies

and delineates the unique characteristics, pedagogical approaches, and technological affordances of MOOCs, highlighting their capacity to foster open, participatory, and networked learning environments. The findings demonstrate the innovative character of MOOCs as a disruptive influence in higher education, challenging traditional educational paradigms, expanding access to learning opportunities, and empowering learners to engage in self-directed, collaborative, and lifelong learning experiences. The report outlines the fundamental principles and practices underpinning the MOOC model, including openness, scalability, and flexibility, connectivity, and learner autonomy. It discusses the potential benefits, challenges, and future directions of MOOCs in shaping the future of education and professional development. The research underscores the importance of fostering a culture of openness, experimentation, and innovation inside higher education institutions to effectively accept and adapt to the evolving digital learning and practice landscape.

Pappano (2012) conducted a study entitled, "The Year of the MOOC," that offers a thorough examination and assessment of the emergence, growth, and impact of Massive Open Online Courses (MOOCs) within the educational landscape. The study seeks to explore the rapid proliferation of MOOCs, evaluate their capacity to transform higher education, and examine the opportunities, challenges, controversies, and debates surrounding this innovative form of online learning. The study conducts a comprehensive analysis of MOOC platforms, providers, courses, participants, and outcomes, exploring the motivations, strategies, and aspirations driving the MOOC movement. It emphasizes the influence of technology, globalization, accessibility, scalability, and democratization in transforming the dynamics of teaching and learning in the digital era. The findings indicate a significant surge of interest, excitement, and investment in MOOCs among educators, institutions, policymakers, and the public, fueled by the promise of expanding access to quality education, fostering innovation, and addressing the global demand for lifelong learning and skill development. However, the article raises critical questions and concerns regarding the quality, effectiveness, sustainability, accreditation, business models, and long-term viability of MOOCs, as well as the implications for traditional educational institutions, faculty roles, pedagogical practices, and student experiences in the

evolving educational landscape. The study highlights the importance of deliberate reflection, critical analysis, evidence-based research, and collaborative efforts in harnessing the potential benefits of MOOCs while addressing their inherent challenges, limitations, and complexities as a disruptive innovation in higher education.

Daniel (2012), in his article "Making Sense of MOOCs: Musings in a Maze of Myth, Paradox, and Possibility," critically analyzed the emerging phenomenon of Massive Open Online Courses (MOOCs) and the numerous myths, paradoxes, and opportunities associated with this innovative form of online learning. The research aims to elucidate the concept of MOOCs, interrogate existing assumptions, and examine the transformational potential and limitations of MOOCs within the broader context of higher education and lifelong learning. The study employs a reflective and analytical methodology to investigate the fundamental characteristics, pedagogical models, and business models of MOOCs, drawing on a range of empirical studies, case examples, and theoretical frameworks to unravel the complexities and contradictions inherent in the MOOC landscape. The findings underscore the transformative impact of MOOCs in challenging traditional educational paradigms, expanding access to education, and promoting global collaboration and information exchange. However, the study highlights the inherent challenges and controversies surrounding MOOCs, including those related to quality assurance, accreditation, learner support, and the modification of education.

Clow (2013) in his paper, "MOOCs and the funnel of participation," examined learner engagement and participation in Massive Open Online Courses (MOOCs) using the "funnel of participation" model. The research seeks to understand the phases of learner involvement in MOOCs, from initial enrolment to active engagement and course completion, while identifying the determinants affecting learner dropout and attrition rates. The study employed learning analytics and data-driven methodologies to investigate learner activity and interaction development within MOOC platforms, analyzing access, engagement, and completion patterns across diverse learner populations. The results indicated a significant decline in student participation and engagement as the course advanced, underscoring learners'

difficulties in maintaining motivation, managing their workload, and navigating the complex course structure. The research highlighted critical aspects contributing to dropout, including the lack of personalized support, limited social interaction, and overwhelming course content.

Conole (2013) examined “MOOCs as disruptive technologies: strategies for enhancing the learner experience and quality of MOOCs”. The study determined that multiple factors were influencing education. The research indicated that universities progressively sought to expand their online offerings and use technologies more effectively. The results also showed a growing demand for higher-level students with greater diversity. It also demonstrated that knowledge recall needs to be shifted to developing skills for finding and utilizing information effectively. Ultimately, conventional institutions have to adapt to new competitive niches and developing business models.

Liyanagunawardena, Adams, and Williams (2013) in their article, "MOOCs: A systematic study of the published literature 2008-2012," provided an extensive survey and analysis of the academic literature about Massive Open Online Courses (MOOCs) during their early development from 2008 to 2012. The research seeks to delineate the emerging trends, themes, methodologies, and debates in the rapidly expanding field of MOOC research, offering a fundamental comprehension of the principal difficulties, challenges, and opportunities associated with this innovative form of online learning. The study examines the diverse perspectives, theoretical frameworks, pedagogical models, and empirical findings shaping the discourse on MOOCs through a systematic review of peer-reviewed articles, conference papers, reports, and other scholarly publications. The findings indicate an expanding corpus of MOOC literature characterized by a wide range of research topics, methodological approaches, and disciplinary perspectives, reflecting the multifaceted nature of MOOCs and their potential to transform contemporary education and learning environments. The study identifies several prominent themes and research gaps in the existing literature, including issues related to learner engagement, course design, pedagogical effectiveness, institutional adoption, and policy implications. The research also highlights the evolving nature of MOOCs, the diversity of MOOC

platforms and providers, and the global impact of MOOCs on educational access, equity, and quality.

Mullaney (2013) in his article, "MOOCs: A pedagogical perspective," offered a critical examination of the pedagogical foundations, instructional strategies, and learning theories underpinning Massive Open Online Courses (MOOCs). The research aims to explore the evolving pedagogical landscape of MOOCs, assess the alignment of MOOC designs with established educational principles, and identify opportunities and challenges for pedagogical innovation and improvement in open online learning environments. Through a comprehensive analysis of MOOC literature, course designs, and instructional practices, the study investigates the diverse pedagogical models, learning theories, and teaching strategies employed in MOOCs, ranging from traditional didactic approaches to more learner-centered, collaborative, and experiential learning paradigms. The findings reveal a heterogeneous and dynamic pedagogical landscape in MOOCs, characterized by a wide range of instructional approaches, assessment methods, learner interactions, and support mechanisms, reflecting the diverse goals, contexts, and target audiences of MOOC initiatives. The study identifies several vital pedagogical considerations and challenges in MOOC design and implementation, including clear learning objectives, meaningful learning activities, engaging and interactive content, personalized learning pathways, formative and summative assessments, learner support, and community building. The research also highlights the potential of MOOCs to foster innovative pedagogical practices, promote lifelong learning, and democratize access to education while emphasizing the importance of continuous reflection, experimentation, and adaptation to enhance the quality, effectiveness, and impact of MOOCs on contemporary education and learning experiences in the digital age.

Rienties, Brouwer, and Lygo-Baker (2013) investigated the impact of online professional development on the beliefs and intentions of higher education teachers regarding learning facilitation and technology integration in their teaching practices. The research aims to investigate the effectiveness of online professional development programs in promoting pedagogical innovation, enhancing technology-enhanced learning (TEL) competencies, and fostering a learner-centered approach among

higher education instructors. Through a mixed-methods research design, incorporating pre- and post-intervention surveys, interviews, and observations, the study examines the changes in teachers' beliefs, attitudes, perceptions, and intentions toward learning facilitation and technology use following their participation in an online professional development program. The findings reveal positive shifts in teachers' beliefs and intentions towards adopting more student-centered, interactive, and technology-mediated teaching strategies, as well as increased confidence and willingness to integrate innovative pedagogical practices and digital tools into their teaching and learning environments. The research highlights the potential of online professional development to empower teachers, build capacity, and facilitate transformative change in teaching practices while promoting reflective practice, collaborative learning, and continuous professional growth in the rapidly evolving landscape of higher education. The study also identifies several key factors influencing the effectiveness of online professional development, including the design of the professional development program, the quality of instructional support and feedback, the relevance and applicability of the content, the opportunities for collaboration and networking, and the institutional support and recognition for innovative teaching and technology integration.

Rodriguez and Armellini (2013) studied, "Economic Impact of the MOOC," which provides a comprehensive analysis of the economic implications, benefits, and challenges associated with Massive Open Online Courses (MOOCs) from a global perspective. The research aims to examine the economic models, revenue streams, cost structures, investment strategies, and financial sustainability of MOOC platforms and providers, as well as the broader economic impact of MOOCs on higher education institutions, economies, and societies at large. Through a detailed exploration of the business models, market dynamics, and economic trends shaping the MOOC landscape, the study investigates the potential of MOOCs to generate revenue, reduce costs, expand market reach, foster innovation, and drive economic growth and competitiveness in the global knowledge economy. The findings reveal a diverse and evolving economic landscape in the MOOC market, characterized by a wide range of monetization strategies, partnership models, pricing strategies, and

funding mechanisms employed by MOOC platforms and providers to sustain and scale their operations while balancing the demands for accessibility, affordability, quality, and profitability. The research also highlights the transformative potential of MOOCs to democratize access to education, bridge educational gaps, foster lifelong learning, and empower individuals, communities, and nations to adapt to the changing demands and opportunities of the digital age. However, the report also identifies several critical economic challenges, uncertainties, and risks associated with the MOOC model, including revenue generation, cost management, market competition, quality assurance, accreditation, regulatory compliance, and long-term sustainability.

Rosenberg (2013) undergone a study entitled, "MOOCs and the Library: Engaging with evolving pedagogy," exploring the role of academic libraries in supporting and enhancing the pedagogical practices, information literacy, and learning experiences within Massive Open Online Courses (MOOCs). The research aims to examine the evolving relationship between MOOCs and libraries, assess the impact of MOOCs on library services, resources, and partnerships, and identify opportunities for libraries to engage with MOOCs, faculty, and learners in fostering information literacy, research skills, and lifelong learning in the digital age. Through a comprehensive analysis of the intersection between MOOCs, library services, and pedagogical innovation, the study investigates the strategies, initiatives, and collaborations undertaken by libraries to integrate library resources, services, and expertise into MOOC platforms and courses and to support MOOC participants in navigating and accessing the vast array of digital resources, databases, and information available online. The findings reveal a growing recognition and involvement of libraries in the MOOC landscape, characterized by the development of MOOC-specific library services, the integration of library resources into MOOC platforms, the provision of online tutorials, guides, and support for MOOC participants, and the fostering of partnerships and collaborations between libraries, MOOC providers, educators, and institutions to enhance the quality, accessibility, and impact of MOOCs on teaching, learning, and research in higher education and beyond. The study also highlights the challenges and opportunities facing libraries in

adapting to the evolving pedagogical practices and technological advancements of MOOCs, including issues related to copyright, licensing, access, preservation, privacy, digital literacy, and the changing roles and responsibilities of librarians in supporting and facilitating learning in open and online learning environments.

Chatterjee and Nath (2014) evaluated the potential of Massive Open Online Courses (MOOCs) as a transformative educational tool in India, particularly for individuals in rural areas who lack access to quality education. The authors have explored different aspects and strategies for implementing Massive Open Online Courses (MOOCs) across India, focusing on how these courses can be adapted to meet the needs of a diverse and large population, particularly in rural areas where access to quality education is limited. The study emphasized the role of technology in enhancing the education sector and contributing to national development.

DeBoer, Ho, Stump, and Breslow (2014) studied, "Changing 'course': Reconceptualizing educational variables for massive open online courses," delving into the need for a paradigm shift in understanding and evaluating educational variables within the context of Massive Open Online Courses (MOOCs). The research aims to reconceptualize traditional educational metrics and frameworks to better capture the unique characteristics, pedagogical approaches, and learner experiences associated with MOOCs. Through a comprehensive analysis of existing literature, empirical studies, and MOOC datasets, the study identifies and examines key educational variables often overlooked or misunderstood in assessing and evaluating MOOCs, including course design, learner engagement, pedagogical effectiveness, and learner outcomes. The findings challenge conventional wisdom and offer new insights into the dynamic and multifaceted nature of MOOCs, highlighting the importance of adopting a more holistic and context-sensitive approach to understanding and evaluating these platforms. The study also emphasizes the need to develop innovative methodologies, tools, and frameworks for assessing and enhancing the quality, effectiveness, and impact of MOOCs on diverse learner populations and educational settings.

Ebben and Murphy (2014) studied, "Unpacking MOOC scholarly discourse: A review of nascent MOOC scholarship," which offers a comprehensive review and analysis of the emerging scholarly discourse on Massive Open Online Courses (MOOCs). The research aims to identify, categorize, and critically evaluate the evolving body of literature on MOOCs, shedding light on the key themes, methodologies, theoretical frameworks, and trends shaping the field of MOOC research. Through a systematic review of nascent MOOC scholarship published in academic journals, conference proceedings, and other scholarly publications, the study explores the diverse perspectives, debates, and controversies surrounding MOOCs, including their pedagogical models, learner experiences, institutional implications, and societal impact. The findings reveal a rapidly growing and increasingly diverse body of MOOC scholarship characterized by various disciplinary perspectives, methodological approaches, and research foci. The study identifies several prominent themes and research gaps in the existing literature, highlighting the need for further empirical research, theoretical development, and critical reflection to advance our understanding of MOOCs and their role in transforming contemporary education and learning environments.

Hill and Barber (2014) investigated, "MOOCs: Expectations and Reality," which critically examines the promises, expectations, and realities surrounding Massive Open Online Courses (MOOCs) as a transformative force in higher education. The research aims to scrutinize the potential of MOOCs to revolutionize access to education, enhance learning experiences, and disrupt traditional educational models, contrasting these aspirations with the outcomes, challenges, and limitations observed in the emerging MOOC landscape. Through a comparative analysis of MOOC initiatives, policies, and practices across diverse institutional contexts and geographical regions, the study explores the discrepancies between the hype and the actual impact of MOOCs on educational access, quality, equity, and sustainability. The findings reveal a complex and multifaceted picture of MOOCs, characterized by both unprecedented opportunities and significant challenges, including issues related to course completion rates, learner engagement, and pedagogical effectiveness, accreditation, and monetization strategies. The study also highlights the diverse

perspectives, debates, and controversies surrounding MOOCs among educators, policymakers, stakeholders, and the broader public, emphasizing the need for critical reflection, evidence-based research, and collaborative efforts to realize the transformative potential of MOOCs while addressing the inherent challenges and limitations.

Hollands and Tirthali (2014) conducted a study entitled, "MOOCs: Expectations and Reality," offering an in-depth analysis of the promises, expectations, and realities associated with Massive Open Online Courses (MOOCs) in the context of higher education. The research aims to critically evaluate the potential of MOOCs to democratize access to education, expand learning opportunities, and transform traditional educational paradigms, contrasting these ambitious goals with the outcomes, challenges, and limitations observed in the rapidly evolving MOOC landscape. Through a comprehensive review of MOOC initiatives, policies, and practices, the study explores the discrepancies between the anticipated benefits and the tangible impacts of MOOCs on educational access, quality, equity, and cost-effectiveness. The findings reveal a nuanced and complex picture of MOOCs, characterized by unprecedented opportunities and significant challenges, including course completion rates, learner engagement, pedagogical effectiveness, accreditation, financial sustainability, and institutional adoption. The study also highlights the diverse perspectives, debates, and controversies surrounding MOOCs among educators, policymakers, stakeholders, and the broader public, emphasizing the need for critical reflection, evidence-based research, and collaborative efforts to harness the transformative potential of MOOCs while addressing the inherent challenges and limitations.

Hollands and Tirthali (2014) studied, "Why do institutions offer MOOCs?" They investigated the goals of institutions of higher education that were currently developing and delivering courses by reviewing the literature and conducting interviews with 83 individuals knowledgeable about MOOCs. The study identified six significant goals for MOOC initiatives: extending reach and access, building and maintaining a brand, improving economics by reducing costs or increasing revenues, improving educational outcomes, innovation in teaching and learning, and

conducting research on teaching and learning. Comparing these goals with the data collected about MOOCs, their participants, educational outcomes, and the resource requirements and cost drivers of the development and delivery process, the assessment was undertaken to determine whether these goals were being met or are likely to be in the future. While the quantification of success in achieving these goals was largely lacking, the study's findings concluded that institutions were experiencing at least partial success in achieving each of these goals, except for improving the economy. The study identified obstacles to the fuller achievement of the goals and proposed some potential solutions.

Jordan (2014) examined, "Initial Trends in Enrolment and Completion of Massive Open Online Courses," providing a comprehensive analysis of the enrolment patterns and completion rates in Massive Open Online Courses (MOOCs) during their initial development and implementation phase. The research explores the factors influencing learner participation, engagement, and completion in MOOCs, shedding light on the demographic characteristics, motivational factors, and learning behaviors of MOOC participants. The study examines the trends, patterns, and disparities in MOOC participation and completion rates among diverse learner populations through a systematic analysis of MOOC enrolment data, completion rates, and learner demographics across various MOOC platforms and disciplines. The findings reveal a significant discrepancy between enrolment and completion rates in MOOCs, with a large proportion of learners enrolling in courses but failing to complete them. The study identifies several key factors contributing to high dropout rates in MOOCs, including lack of motivation, time constraints, course design issues, and inadequate learner support and engagement strategies. The research also highlights the potential of MOOCs to expand access to education and reach underserved learner populations while emphasizing the need for innovative pedagogical approaches, personalized learning experiences, and targeted support mechanisms to enhance learner engagement, persistence, and success in MOOCs.

Milligan and Littlejohn (2014) in their article entitled, "Supporting Professional Learning in a Massive Open Online Course," examined the design, implementation, and support mechanisms of a Massive Open Online Course (MOOC) intended to

facilitate professional learning and development for educators and professionals across various fields. The research examines the challenges, opportunities, and strategies involved in supporting professional learning within MOOCs. It identifies effective pedagogical practices, support mechanisms, and design principles that contribute to meaningful and transformative learning experiences in open online environments. Through a comprehensive case study of a professional development MOOC, the study employs a qualitative research methodology to examine the roles of course design, instructional strategies, technological tools, facilitation, and learner support in fostering engagement, collaboration, and reflective practice among MOOC participants. The findings reveal the critical importance of providing tailored, context-specific, responsive support mechanisms, including scaffolding, mentorship, peer collaboration, and reflective activities, to enhance learner motivation, engagement, and success in professional learning MOOCs. The study identifies several key factors influencing professional learning in MOOCs, including aligning course goals with professional needs, integrating real-world tasks and authentic learning experiences, cultivating a supportive learning community, and providing timely and constructive feedback. The research also highlights the potential of MOOCs to democratize access to high-quality professional learning opportunities, foster lifelong learning, and empower educators and professionals to adapt to the evolving demands and challenges of their respective fields.

Nkuyubwatsi (2014) investigated a study entitled, "MOOCs in developing countries: Opportunities and challenges," exploring the potential benefits, opportunities, and challenges of Massive Open Online Courses (MOOCs) in the context of developing countries. The research aims to examine the unique socio-economic, cultural, technological, and educational contexts of developing nations and assess the implications of MOOCs for expanding access to quality education, enhancing learning opportunities, and fostering socio-economic development and capacity building in these regions. Through a comprehensive analysis of the emerging MOOC landscape in developing countries, the study investigates the adoption, adaptation, and integration of MOOCs into the educational systems, policies, and practices of diverse nations, highlighting the diverse motivations, strategies, and experiences of

MOOC providers, educators, learners, and stakeholders in leveraging MOOCs to address local educational challenges and opportunities. The findings reveal a growing interest and investment in MOOCs across developing countries, driven by the potential of MOOCs to democratize access to education, bridge educational gaps, foster innovation, and empower learners to acquire relevant knowledge, skills, and competencies for personal, professional, and community development. However, the study also identifies several key challenges and barriers to the effective implementation and utilization of MOOCs in developing contexts, including inadequate technological infrastructure, limited internet accessibility, low digital literacy, language diversity, cultural irrelevance, pedagogical misalignment, institutional capacity constraints, sustainability concerns, and scalability issues. The research highlights the importance of contextualizing MOOCs to meet the diverse needs, aspirations, and realities of learners in developing countries, fostering local collaborations, partnerships, and capacity-building initiatives, and promoting innovative pedagogical models, supportive learning environments, and inclusive educational practices to maximize the potential benefits and mitigate the challenges of MOOCs in advancing educational equity, quality, and accessibility in the digital age.

Sánchez-Vera, Leon, and Davis (2014) in their paper introduced the VUSSC (Virtual University for Small States of the Commonwealth) model as a unique framework for implementing networked learning in post-secondary education across small states within the Commonwealth. The research aims to explore the design, development, implementation, and evaluation of the VUSSC model, examining its effectiveness in fostering collaborative, participatory, and inclusive learning environments. This will enhance educational access, quality, and relevance, while promoting capacity building and sustainable development in diverse and resource-constrained contexts. Through a comprehensive analysis of the VUSSC initiative, the study investigates the pedagogical principles, technological infrastructures, collaborative partnerships, and policy frameworks underpinning the VUSSC model, highlighting its innovative approach to leveraging technology-enhanced learning, open educational resources (OER), open and flexible learning pathways, and cross-

border collaboration to address the unique academic challenges and opportunities facing small states and marginalized communities in the global knowledge economy. The findings reveal the transformative potential of the VUSSC model in promoting learner-cantered pedagogies, fostering lifelong learning, empowering educators and learners, and facilitating the co-creation, sharing, and adaptation of knowledge and resources within and across diverse cultural, linguistic, and socio-economic contexts. The research also identifies several key factors influencing the successful implementation and scalability of the VUSSC model, including institutional capacity building, policy alignment, stakeholder engagement, sustainability, quality assurance, and cultivating a supportive, inclusive, and participatory networked learning community.

Anitha Kaveri (2015) undertook a study on “Decoding the Indian MOOC learner” to understand some of the essential characteristics distinguishing a MOOC user from a non-user in India. A survey method was employed in the study to understand MOOC users based on variables including age, occupation, gender, educational backgrounds, salient aspects of their personality, learning styles, and life goals. The study's findings revealed that those with better internet skills and an existing preference for learning through videos were significantly more likely to adopt MOOCs. Personality traits aligned with an openness to try new things also influenced the adoption decision. However, the learning styles and environment did not differentiate users from non-users.

Conole (2015) conducted a study on “Designing effective MOOCs.” The study highlighted the advantage of MOOCs, enabling participants to be part of a global community of peers and to experience learning through social media, while also facilitating social inclusion. On the contrary, the study also revealed the challenges associated with MOOCs. Firstly, most have very high dropout rates. Secondly, there were challenges with approaches to recognition of learning and issues with learner authentication and cheating. Thirdly, there were issues with providing support at scale. The study described a 12-dimensional classification schema for defining and designing MOOCs based on associative, cognitive, constructivist, situative, and connectivity pedagogies.

Margaryan, Bianco, and Littlejohn (2015) in their study, "Instructional quality of massive open online courses (MOOCs)," delves into the assessment and evaluation of the instructional quality of MOOCs, aiming to identify critical factors, dimensions, and criteria that contribute to effective teaching and learning in these open online environments. The research aims to critically examine the pedagogical approaches, instructional design strategies, and learning experiences offered by MOOCs, and to evaluate their alignment with established principles of effective teaching and learning. Through a comprehensive analysis of a diverse sample of MOOCs across various disciplines and platforms, the study employs a qualitative methodology to evaluate the quality, coherence, and effectiveness of MOOC instruction, focusing on course design, learning activities, assessment methods, learner engagement, and support mechanisms. The findings reveal a wide range of instructional quality across different MOOCs, with some courses demonstrating exemplary pedagogical practices and innovative learning experiences. In contrast, others exhibit limitations, inconsistencies, and challenges in instructional design and delivery. The study identifies several critical dimensions of instructional quality in MOOCs, including clear learning objectives, well-structured content, interactive and engaging learning activities, meaningful assessments, personalized learning pathways, and comprehensive learner support. The research also emphasizes the significance of learner-centered design, active learning strategies, social interaction, and collaborative learning environments in improving the instructional quality and overall learning experience in MOOCs.

Nisha and Senthil (2015) examined "MOOCs: Changing Trend towards Open Distance Learning with Special Reference to India." Based on the study's results, providing timely support and assessment of students has become a major challenge. The study also concluded that MOOCs and online education have a huge potential to help accelerate and ensure social cohesion and sustainable growth. With little effort by the government of India, online education can successfully reach every individual.

Soni (2015) undertook a study, "A Study on Problems and Prospects of E-learning in India," to investigate the problems related to e-learning and analyze its prospects in higher education in India, identify its success factors for the implementation of e-

learning, and make suggestions for a suitable e-learning model for the higher education sector in India. The study was descriptive cum exploratory in nature, and a self-structured survey instrument was developed for collecting the data. The study's findings identified significant dimensions related to problems such as perceptual issues, technology-based issues, environment-based issues, pedagogy and content-based issues, accessibility-based issues, cost-based issues, training and skill-based issues, and satisfaction-based issues. The study's results analyzed and demonstrated the various prospects of e-learning in higher education in India, including online education, blended learning, distance and open education, collaborative and cooperative learning, improvements in the teaching-learning process, and practical education. The study also explored and compared various e-learning models, concluding that the Massive Open Online Course (MOOC) was the most suitable approach for addressing the problems associated with higher education in India.

Fidalgo-Blanco, Sein-Echaluce, and Garcia-Penalvo (2016) explored the innovative pedagogical approach of combining elements of xMOOCs (instructional-based) and cMOOCs (connectivist-based) to create a hybrid MOOC model. The research investigates the effectiveness, learner engagement, and outcomes of this blended pedagogical approach in MOOCs, transitioning from focusing on massive access to fostering collaboration and cooperation among learners. Through a comprehensive analysis of a hybrid MOOC course implemented in higher education settings, the study examines the design, implementation, and evaluation of the course, highlighting the key pedagogical strategies, technological tools, and collaborative learning environments employed to facilitate active participation, knowledge sharing, and community building among learners. The findings reveal positive outcomes and proven results of the hybrid MOOC model, including increased learner engagement, enhanced collaboration, improved learning outcomes, and positive participant feedback. The study also identifies valuable lessons learned, challenges encountered, and recommendations for future MOOC design and implementation, emphasizing the importance of integrating both instructional and connectivist approaches to create engaging, interactive, and meaningful learning experiences in MOOCs.

Laxmisha Rai and Deng Chunrao (2016) studied “Influencing factors of success and failure in MOOC and general analysis of learner behavior.” The data was collected through survey methods from MOOC learners. The study's results revealed that the primary reasons for failures were a lack of learning, inadequate personal support and human intervention, low motivation, a high level of difficulty, and an uncontrolled environment. Whereas Enthusiastic and Self-Motivated Learners, Job and Career Requirements, Authenticated Certificates, University and Teacher Reputations, Flexibility to Make Mistakes, and Instant Feedback were the reasons for the success of MOOCs.

Ruiperez-Valiente, Cobos and Munoz-Merino (2016) studies presented a rigorous multilevel analysis to identify and compare learning behaviors exhibited by participants in xMOOCs (structured, instructor-led courses) and cMOOCs (connectivist, community-driven courses). The research aims to explore learners' distinct patterns, interactions, and engagement strategies in these two types of MOOCs, shedding light on the factors that influence learner participation, collaboration, and success in open online learning environments. Through a detailed case study approach, utilizing data analytics, statistical modelling, and qualitative methods, the study examines the learning behaviors, activities, and trajectories of MOOC participants across different platforms, disciplines, and learning contexts. The findings reveal significant differences in learning behaviors and engagement patterns between xMOOCs and cMOOCs, with xMOOC participants demonstrating more structured, individualistic, and goal-oriented behaviors. In contrast, cMOOC participants exhibited more exploratory, collaborative, and networked learning behaviors. The research highlights the importance of considering the pedagogical design, instructional strategies, community support, and technological affordances of MOOCs in shaping learner behaviors, experiences, and outcomes in open and flexible learning environments. The study also identifies several key factors influencing learner engagement, persistence, and success in MOOCs, including course design, content relevance, learner autonomy, social interaction, peer collaboration, facilitation, feedback, and support mechanisms.

Bharali (2017) conducted a study titled “A Study on Perception Towards MOOCs in Traditional Educational Institutions” among 65 students and 20 teachers from diverse educational backgrounds in the Guwahati area of India. The questionnaire consisted of 23 questions and aimed to provide a brief introduction to MOOCs. It sought to gather insights from college and university teachers and students in India about their general opinions on MOOCs and suggestions on how they could become more popular. The questionnaire asked about familiarity with MOOCs, knowledge of providers and courses, suitable users, and openness to pursuing them. After learning about MOOCs, most participants agreed on their necessity and were interested in taking a course. The study revealed that many had not heard of MOOCs but believed they were best suited for those seeking knowledge outside of a traditional classroom setting. Most people learn about MOOCs through TV, newspapers, and social media, while radio is the least popular source of information, according to the present study. The study's findings also showed that most participants believed that students should take an active role in promoting the use of MOOCs and that improving infrastructure and internet services in India was crucial to making MOOCs more popular.

Chauhan and Goel (2017) prepared an “overview of MOOCs in India” for a comparative study of different online platforms and the challenges faced in implementing MOOCs in India. The study revealed the significant challenges concerning the implementation of MOOCs in India, including technological infrastructure, investment, diverse learner needs, the adoption of MOOCs among learners, and the issue of quality education.

De Waard (2017) studied “Self-Directed Learning of Experienced Adult Online Learners Enrolled in FutureLearn MOOCs.” The study led to the development of a conceptual framework that outlines the different factors affecting the learning experience of adult informal learners participating in FutureLearn MOOC courses. The study comprises five main learning components: individual and social learning, context, technology, media elements, organizing learning, and learner characteristics. Motivation and learning goals influenced these components, as for adult informal learners, motivation is usually intrinsic, and learning goals are often personal. The study involved 56 adult learners with prior online experience who engaged in self-

directed individual or social learning using any device to participate in a FutureLearn MOOC course. The research drew on literature from MOOCs, mobile learning, and informal learning to support the findings and provide a rationale for choosing self-directed learning over similar concepts. Data was collected through an online survey before the course, self-reported learning logs during the course, and semi-structured one-on-one interviews after the course. The data was analyzed using Charmaz's method for constructing a grounded theory, which included memo writing, open coding, line-by-line coding, and focused coding. This analysis led to the development of a grounded theory that provided insights into the self-directed learning experiences of FutureLearn participants. The study's findings concluded that understanding self-directed learning in FutureLearn courses can provide valuable insights to enhance informal learning, instructional design, and personalization of learning within FutureLearn courses, ultimately creating a more meaningful learning experience.

Li (2017) conducted a comparative study on "Massive Open Online Courses (MOOCs) in the United States, China, and India". The study dealt with the detailed characteristics of MOOCs in three distinct countries: The United States, China, and India. Comparative research, driven by different cultural backgrounds, social needs, and economic development statuses, will shape the MOOC industry, participant characteristics, and industry development differently across countries.

Sheikh and Gupta (2017) analyzed the foundation of Massive Open Online Courses (MOOCs) and the trends in education that these courses have initiated, particularly focusing on their impact on traditional higher-education teaching and learning processes. The study addressed both the opportunities and challenges presented by MOOCs, providing a comprehensive perspective on their impact within the Indian educational context.

Chatti, Muslim and Schroeder (2018) investigated the factors contributing to learner inactivity in Massive Open Online Courses (MOOCs), focusing specifically on forum participation as a key indicator of learner engagement and involvement. Recognizing the critical role of learner interaction and participation in MOOCs, this

research aims to identify why learners often become inactive and disengaged from course forums, despite the open and collaborative nature of MOOC platforms. Through an empirical analysis of forum data from multiple MOOCs, the study employed quantitative and qualitative methods to examine patterns of forum participation, identify common reasons for learner inactivity, and explore the impact of various factors such as course design, learner demographics, and social interactions on forum engagement. The findings revealed several significant factors contributing to learner inactivity, including the overwhelming volume of forum posts, lack of instructor involvement, perceived irrelevance of forum discussions, and time constraints faced by learners. The study also highlighted the importance of designing effective forum structures, providing clear guidelines, and fostering a supportive learning community to enhance learner engagement and mitigate dropout rates in MOOCs.

Banwari (2018) conducted a study on “Role of MOOCs in Indian Higher Education,” highlighting that MOOCs play a significant role in increasing Gross Enrolment Ratio in Indian higher education and are cost-effective for rural populations. While MOOCs offer diverse courses from top universities and free access to content, they cannot fully replace traditional classroom experiences, personalized teaching, or the physical presence of educators. The study also noted several challenges, including the need for a reliable internet connection and difficulties in tracking student engagement and assignments.

Sharma (2018) undertook a study on “The Role of Massive Open Online Courses (MOOCs) in Furthering Executive Education in India.” The study's primary purpose was to understand the role of MOOCs, the demographic and psychographic factors, the motivational factors, and their effectiveness among working professionals in India. A survey method was employed for the present study, where data were collected from MOOC users, and a questionnaire was shared with 350 working professionals. The study's findings revealed that, concerning demographic and psychographic factors, male respondents take MOOCs more frequently than female respondents. On the other hand, studies have also shown that both genders across age groups attach similar importance to ‘social status’ and ‘social influence.’ It was also

found that all working professionals consider MOOCs an essential source for acquiring knowledge, developing skills, and enhancing their social reputation. The study also found that, regarding psychographic factors, the attitude of male working professionals was higher than that of female working professionals. The study also concluded that both male and female working professionals gave equal importance to the social influence factor of psychographics.

Deng, Benckendorff and Gannaway (2019) conducted a study on “Progress and new directions for teaching and learning in MOOCs.” The study presented a narrative literature review concerning the landscape of learning and teaching in MOOCs. The study evaluated 102 academic studies published between 2014 and 2016 on the learning and teaching aspects of MOOCs. These studies were analyzed using Biggs’ 3P Model of Teaching and Learning as a framework for organizing the data. Five critical findings were adopted from the study: firstly, the study revealed that evidence-based research was scarce on non-mainstream consumers of MOOCs; secondly, it showed that the role of learner factors was oversimplified in evidence-based MOOC research; thirdly, the study proved that there was no effort to reconcile different approaches to measuring learner engagement with MOOCs; fourthly, measures of learning outcomes lack sophistication and were often based on single variables; and finally, the study concluded that the relationships between many of the key learning and teaching factors had not been clarified.

Majid, Kamarudin and Zamin (2019) investigated “Postgraduate students’ perception of Massive Open Online Courses (MOOCs) in enhancing their learning experience”. The study's findings concluded that MOOCs, due to their user-friendliness, accessibility, and sharing opportunities, provide an advanced learning platform for adult learners, and that several attributes help maximize their learning potential. The study also showed that postgraduate students favored the learning platforms, as MOOCs had provided learners with opportunities that emphasized meaningful and hands-on learning, tailored to their learning needs, thereby addressing their learning process and achieving optimal outcomes.

Latha (2019) examined “Challenges and Implications of Learning through Massive Open Online Course (MOOC): A Consumer Perspective in India.” The researcher attempted to address the low success rate of MOOCs, explored the factors that help learners fulfil the courses, and also assisted course providers in improving the success rate. The researcher incorporated the principles of engagement theory to understand the factors of learner engagement. The researcher adopted a descriptive research design with a sample size of 663 respondents. Data were collected through an online survey method, and a structured questionnaire was developed for the study. The study's findings revealed that consumer motivation and engagement with course design elements significantly influenced consumer-perceived learning. The study further demonstrated that consumer engagement played a crucial role in consumer motivation and perceived learning, as well as in the relationship between course design elements and perceived learning.

Uppal (2019) explored the “Effectiveness of Massive Open Online Courses for Training Teachers in Higher Education” to identify the challenges and opportunities that MOOCs offer in the field of teacher training, as well as the knowledge and skills that can be achieved through MOOCs for the professional development of teachers. The researcher used an experimental method for the present study. A pre-experimental design with a single group post-test was employed to study the cause-and-effect relationship scientifically. The study's findings showed that MOOCs make knowledge-building possible for higher education teachers. The study also indicated that the perceptions of digital fluency among higher education teachers and their views of the MOOC were positive, implying that their perceptions of digital fluency did not impact their achievement. The study also revealed that learning through MOOCs had many perspectives that did not necessarily impact the participant's achievement. The study also analyzed the discussion forums, where several responses indicated that these activities and assessments should be designed to encourage posting on discussion forums, social networking sites, and other platforms. The study also suggested that higher-level thinking, reflection, and initiation should be included to create knowledge-building and foster community-building through MOOCs.

You (2019) analyzed “Students’ Perception about Learning using MOOC.” The study examined factors such as personal characteristics, learning strategies, cognitive appraisal, and demographics specifically, gender in relation to the use of MOOCs. The study also investigated how the perceived usefulness and ease of use of MOOCs affected their adoption. The participants were pre-university students from a university in Selangor, Malaysia, who took part in a MOOC as part of an offline course requirement. Out of the 87 students who participated, 66 were randomly selected as respondents. The study's quantitative analysis revealed a positive correlation between perceived usefulness and ease of use, as well as the challenges faced by the students. This means that the more students intended to use MOOCs, the more confident they were that they would not face any difficulties using them, but they also faced more challenges. The study also found that the more students believed there were no obstacles to using MOOCs, the more they became deep learners and were less threatened by using them. The study demonstrated that the platforms and contents of MOOCs had a significant impact on the learning strategies and cognitive appraisal of students. It also showed that female students were more inclined to deep learning and were less threatened by adopting MOOCs than male students. The findings indicated that students had different individual characteristics when accepting technology in their study environment.

Ambadkar (2020) undertook a study on “E-Learning Through SWAYAM MOOCs Awareness and Motivation Among Commerce Students.” The study focused on the introduction of Massive Open Online Courses (MOOCs) and their impact on the education sector in India. This study examines the awareness of MOOCs and the SWAYAM platform among Commerce students, as well as the factors influencing their utilization of SWAYAM-MOOCs. The study revealed low awareness of SWAYAM MOOCs among Commerce students, although a positive attitude towards learning through SWAYAM MOOCs was observed. Lack of ICT skills was identified as one of the significant factors influencing the utilization of MOOCs as a learning tool. Another study result showed that the lack of classroom teaching and one-to-one contact with educators was also perceived as a constraint in learning through MOOCs. The study concluded that students need to be encouraged to adopt

MOOCs as a learning resource. This will require a collaborative effort between the Government, all national coordinators of SWAYAM, Universities, and Industry-Academia interactions to promote the acceptability of certification provided by SWAYAM in the job market.

Bordoloi et al. (2020) highlighted the importance of lifelong learning in India, underscoring the role of Massive Open Online Courses (MOOCs) and Open Educational Resources (OERs) in offering global learning opportunities that enable individuals to continually upgrade their knowledge and skills, thereby improving their livelihood prospects. It pointed out the potential of MOOCs, particularly under the SWAYAM platform, to promote access, equity, and quality in education while addressing the challenges faced in their adoption and implementation. The study employed a descriptive research methodology to analyze the role of MOOCs in promoting lifelong learning opportunities in India. This approach allows for a comprehensive examination of the current state and challenges of MOOCs within the Indian educational context. The study incorporated data from various secondary sources, including the 2011 Census Report, the Human Development Reports for 2016 and 2018, and the Economic Survey 2016, to support the analysis and discussions regarding the implementation and effectiveness of MOOCs in India. The results indicated that while MOOCs, particularly under the SWAYAM platform, have the potential to provide lifelong learning opportunities in India, significant challenges exist to their adoption and development. These challenges include the limited popularity of online education among the broader population and the existing loopholes in the implementation of the Choice-Based Credit System (CBCS) mandated by the University Grants Commission (UGC). The research emphasized the need for a detailed study of the available MOOCs in India to identify common problems and challenges in their development and implementation. The evidence suggested that addressing these issues is crucial for effectively utilizing MOOCs to meet the lifelong learning needs of individuals in the country.

Kundu and Bej (2020) investigated the perceptions and adoption of Massive Open Online Courses (MOOCs) among students and teachers in Indian State Universities, highlighting their potential to complement traditional learning and provide

opportunities for reskilling and upskilling. The study involved a qualitative survey of 480 respondents from 10 State Universities, including semi-structured interviews with 25 participants. The study found that MOOCs have been effective in meeting the learning goals of students and teachers at State Universities in India, complementing traditional learning environments and providing opportunities for re-skilling and up-skilling. However, it was found that participation in MOOCs remains low, particularly among female learners, due to factors such as a lack of awareness and inadequate infrastructure. The research also highlighted the need for Indian policymakers to create a supportive environment for MOOCs, thereby enhancing accessibility for students and leveraging their potential to improve the quality of higher education in the country. The findings provided insights into the current state of MOOCs' penetration, challenges, and opportunities among the largest segment of Indian higher education.

Kurukwar (2020) studied "Perceived Usefulness of MOOCs among Teachers in India." The study investigated the confidence among the teaching fraternity in Massive Open Online Courses (MOOCs) to understand and study the differences in the perceived usefulness of MOOCs among teachers in India. The present study was a descriptive research design. The study used convenience sampling to select respondents, with 66 faculty members responding to the questionnaire. Data was gathered through a systematic and structured questionnaire. Several hypotheses were formulated and tested using one-way ANOVA. The testing results did not provide enough evidence to reject the null hypothesis, indicating no significant difference in the perceived usefulness of MOOCs among male and female teachers, different age groups, and teachers with various qualifications.

Sanzgiri (2020) undertook a study on the demographics, motivations, and experiences of Indian learners in MOOCs, specifically comparing the UK-based FutureLearn platform and the Indian NPTEL platform, using a mixed-methods approach that includes a web-based survey and semi-structured interviews with learners. Findings indicated that Indian MOOC learners are predominantly male, younger, and more educated than those in many existing studies, with distinct differences in motivations and experiences between the two platforms; FutureLearn

users often pursue personal interests, while NPTEL users face technical challenges and use MOOCs to supplement their formal education due to quality issues in Indian universities. An in-depth exploration of learners' experiences revealed that users of FutureLearn are often motivated by personal interests and may utilize the platform to enhance their teaching practices. In contrast, NPTEL learners face more technical challenges, such as connectivity issues, and primarily use MOOCs to supplement their formal education due to the systemic lack of quality education in many Indian universities.

Shankar Raja and Kallarakal (2020) surveyed the impact of COVID-19 on the perception of Massive Open Online Courses (MOOCs) among students in Indian higher educational institutions, highlighting how MOOCs serve as a crisis management solution to ensure continuous education during disruptions. The study emphasized the need for various stakeholders, including the government and educational institutions, to provide flexible and cost-effective learning opportunities to enhance student participation and motivation. The findings revealed that MOOCs are instrumental in keeping students up-to-date with market trends, particularly in areas such as business analytics and artificial intelligence. The study underscores the importance of offering free courses to boost enrollment rates. The evidence suggested that MOOCs can play a vital role in future educational crises, benefiting a wide range of stakeholders and contributing to societal improvement.

Pant et al. (2021) conducted a study examining the trends and factors influencing the adoption of MOOCs in the Indian higher education system, with a particular focus on the COVID-19 pandemic and the shift to online learning. The paper discussed the significant rise in acceptance of online education, particularly massive open online courses (MOOCs), driven by technological advancements, changing student and business demands, and the need for cost reduction and income generation. This trend has been notably accelerated by the COVID-19 pandemic, which compelled educational institutions to transition to online learning to maintain continuity. The study identified various influencing factors that facilitate the adoption of MOOCs, including advances in technology, changing demands from

students and businesses, and the potential for reducing costs and generating income in the educational sector.

Das and Pawar (2022) highlighted the significant growth in MOOC enrollment in India, positioning the country as a leader in this trend, following the US. The study discussed the various platforms, such as NPTEL, mooKIT, IITBX, and SWAYAM, that have been initiated to cater to the rising demand for online education and to meet the educational needs of Indian students. The study addressed the challenges faced in implementing MOOCs in India, emphasizing the need to overcome these obstacles to ensure the program's success. The study provided a theoretical background and technological framework for the MOOC platforms, indicating their potential as affordable and practical alternatives to traditional education.

Dash and Panigrahi (2022) studied the promotion of educational resilience through technology-enhanced learning for sustainable quality education and training in the context of higher education in India: an innovation under CEMCA. The study focused on implementing a MOOC initiative under SWAYAM in collaboration with State Open Universities in other regions of India, particularly West Bengal, Uttarakhand, and Andhra Pradesh, assessing teachers' training and capacity building for developing quality MOOCs. Data collection methods included questionnaires, focus group discussions, and panel discussions, which were analyzed separately to identify the strengths and weaknesses of the initiative aimed at promoting educational resilience through Technology Enhanced Learning (TEL) in higher education. The present study was conducted with a sample of 200 participants to assess various dimensions of the initiative, including teachers' expectations, difficulties, and the level of knowledge, skills, and competencies acquired through the MOOC. Additionally, it aimed to review the components of the MOOC and recommend improvements. The findings highlighted the strengths and weaknesses of the initiative, revealing gaps in the design, development, and implementation stages of the MOOC. Additionally, the study provided insights into the needs, expectations, and requirements of the target group, which will inform improvements to the MOOC and enhanced interventions in higher education.

Gamage (2022) explored the challenges faced by Massive Open Online Courses (MOOCs) in meeting 21st-century skill requirements, emphasizing the need for a systematic understanding of these challenges and the effectiveness of MOOCs in addressing them. The investigation identified issues, including limited interactions and high dropout rates, resulting from a content-driven pedagogical structure, and proposes a framework for evaluating the effectiveness of MOOCs. The research employed exploratory research methods with active data collection from MOOC users, utilizing a mix of qualitative and quantitative approaches to analyze the challenges and factors affecting the effectiveness of MOOCs. The research developed a 10-dimensional framework for evaluating the effectiveness of MOOCs, utilizing qualitative and quantitative methods, including Grounded Theory and Factor Analysis, to understand the challenges and factors that affect MOOC effectiveness. Two systems were designed and developed to enhance MOOC effectiveness: the "Identified Peer Review" (IPR) system, which improves peer review through enhanced communication and incentives, and the Peer Collab system, which integrates theories of communities of practice to foster social presence and collaboration among learners.

Kambli and Thomas (2022) studied undergraduate students' awareness and attitudes towards Massive Open Online Courses (MOOCs). The study used a quantitative research approach with a descriptive research design. MOOCs are a significant part of a larger disruptive innovation in higher education. They have the potential to provide high-quality, contextualized learning content to underserved regions worldwide. The study's objective was to assess undergraduate nursing students' awareness and attitudes toward MOOCs and to evaluate the relationship of these factors with selected demographic variables. The sample selection used non-probability purposive sampling techniques, and data were collected from 89 undergraduate nursing students using a structured questionnaire. The questionnaire used Likert scales, and the data were analyzed using descriptive and inferential statistics. The study found that the majority of students (71.9%) were aged between 19 and 21 years, (77.5%) had never enrolled in any MOOC before, and most (50.56%) had poor awareness regarding MOOCs. The study also found that (53.9%)

of students had a satisfactory attitude towards MOOCs. However, there was no significant association between the awareness and attitude of students who had previously enrolled in MOOCs. The study's findings indicate that most undergraduate nursing students have poor awareness and satisfactory attitudes towards MOOCs.

Lazarus and Suryasen (2022) emphasized the low penetration of massive open online courses (MOOCs) in emerging economies, such as India, and highlighted the potential of MOOCs to improve the quality of higher education. The study identified key drivers for the adoption of a MOOC-based curriculum, including integration into the curriculum, academic library services, and support from the Indian Ministry of Human Resource Development (MHRD). The research suggested a direct relationship between the level of MOOC penetration and the quality of higher education in emerging economies, indicating that enhancing MOOC integration can lead to improved educational outcomes. Additionally, it proposed practical implications for practice and policy, such as classifying MOOC services in academic libraries and developing a decision-making model for hybrid learning strategies in higher educational institutions.

Pant et al. (2022) conducted a study that focuses on learner retention factors in MOOCs, particularly in Indian universities in Uttarakhand, highlighting influences such as credit mobility, course appeal, content localization, and perceived effectiveness. The study employed Structural Equation Modelling to identify and analyze unexplored learner retention factors in Massive Open Online Courses (MOOCs). The study determined that MOOC usage intention is significantly influenced by factors such as willingness to credit mobility, the appeal of trendy courses, content localization, and perceived effectiveness of the courses.

Voudoukis and Pagiatakis (2022) explored the concept of Massive Open Online Courses (MOOCs), highlighting their rapid growth since 2012, when major institutions such as MIT, Harvard, and Stanford launched platforms like edX, Coursera, and Udacity, respectively. The study discussed how MOOCs have transformed higher education by providing greater access to a variety of online

courses, enabling students to pursue educational goals such as obtaining degrees, advancing in their careers, or undergoing corporate training. The study provided a thorough presentation and critical analysis regarding the emergence, meaning, and existing types of MOOCs, which helps in understanding their impact on higher education and the educational strategies of institutions. It discussed the characteristics of MOOCs and their implementation in Europe and Greece, focusing on their significance in the education system and suggesting potential improvements for the current situation. The paper discusses the significant impact of MOOCs on higher education, highlighting that they provide greater access to education for learners worldwide, prompting institutions to reevaluate their educational strategies and adapt to current trends. It notes that MOOCs have become a popular method for continuous learning, allowing students to acquire specialized knowledge and improve their career prospects. The research also addressed the challenges associated with MOOCs, including high abandonment rates, accessibility issues for those without internet access, and limitations in replicating traditional classroom interactions. These factors raise questions about whether MOOCs represent a lasting change in education or merely a transient trend.

Alyoussef (2023) examined the factors influencing university students' acceptance and continued use of Massive Open Online Courses (MOOCs), utilizing concepts from innovation diffusion theory, knowledge management, and the Technology Acceptance Model. The research identified eight key factors that significantly influence university students' continued intention to use MOOCs, which include perceived technology fit, perceived enjoyment, perceived compatibility, trialability, observability, perceived usefulness, perceived ease of use, and attitude towards using the MOOC system. These factors collectively contributed to the perceived usefulness and ease of use, which in turn indirectly affect students' sustained intention to engage with MOOCs. The study found that while perceived compatibility does not influence perceived ease of use, perceived technological fit does not impact perceived usefulness. Additionally, both perceived utility and perceived ease of use were shown to affect knowledge application and access, highlighting the importance of these factors in enhancing the overall learning experience through MOOCs.

Chen (2023) conducted a study on the effect of instructional intervention on MOOC forum discussion, focusing on student engagement and interaction characteristics. The study employed a mixed-method approach that combined social network analysis (SNA) and inductive qualitative analysis to examine the relationships and interactions within an EFL MOOC discussion. Network analysis was utilized to assess the original post and conduct a comparative evaluation of two instances, focusing on the direct reply tie definition to reveal interaction relationships. The study investigated the impact of instructional intervention on student engagement and interaction characteristics within a MOOC forum, utilizing a mixed-method approach that includes social network analysis and qualitative analysis to explore relationships and interactions among students in an EFL MOOC discussion. Findings indicated that teacher-led instructional interventions significantly enhance student participation and interaction, shifting the traditional hub-and-spoke structure of MOOC forums and suggesting that active involvement of teachers and teaching assistants is crucial for promoting independent learning in modern educational contexts.

Das (2023) studied the broader evolution, innovation, and impact of MOOCs in India, particularly under the NMEICT program and the National Education Policy 2020. The research utilizes a diverse range of data sources and methodologies to examine the national scope of MOOCs in India, providing a comprehensive analysis of the subject matter. This included surveying existing literature to identify gaps that the current study aims to fill. An in-depth analysis of specific cases, such as SWAYAM-NPTEL, was conducted to evaluate the innovations in processes and technology adopted in MOOCs, as well as to assess the challenges faced and the effectiveness of measures taken to improve learner retention and engagement. The research revealed that, despite significant adoption and growth in India, there is a notable lack of comprehensive studies examining the outcomes and impacts of MOOCs, particularly in terms of completion rates and the democratization of education. The findings suggested that more attention is needed on the effectiveness and results of MOOCs rather than just their adoption. The study's findings highlighted the need for in-depth research in digital pedagogy and the integration of

AI technologies to enhance the learning experience and outcomes in MOOCs. It emphasized that innovations in processes and technology have been key game changers. Still, there is a gap in the application of emerging technologies, such as Knowledge Graphs and AI-powered MOOCs, which could further enhance the educational landscape in India.

Dwikoranto et al. (2023) explored research trends. They conducted a bibliometric analysis on the utilization of Massive Open Online Courses (MOOCs) within Learning Management Systems (LMS) in university settings, highlighting the increasing popularity and publication rate of this topic in recent years. The study highlighted the potential for further investigation, particularly in integrating MOOCs with blended learning models to enhance students' critical thinking and problem-solving skills. The research identified that while MOOCs in LMS offer various benefits such as improved accessibility, flexibility, and opportunities for additional knowledge acquisition, there are still challenges to be addressed, including limited internet access and the need for appropriate learning content development. Additionally, the study emphasized the necessity for further research to explore these challenges and optimize the implementation of MOOCs in LMS for better educational outcomes.

Hooda and Dahiya (2023) explored “MOOCs: Catalysts for Higher Education Transformation in India”, focusing on the broader context of MOOCs in India, their potential benefits, challenges, and the primary platforms available. The review article conducted a detailed examination of MOOCs, including their history, evolution, and various types, which provides a comprehensive understanding of the subject matter. It highlights the technical and theoretical foundations of MOOC platforms in India, as well as the challenges associated with implementing MOOCs, thereby offering insights into both the advantages and disadvantages of this educational technology. The study examined the significant role of MOOCs in transforming higher education in India, highlighting their potential to reach a broad audience, promote literacy, and enhance the skills of the youth, particularly in addressing unemployment and supporting initiatives like ‘Make in India’ in the digital era. India ranks second globally in MOOC enrolments, with key platforms such as NPTEL, IITBX, mooKIT,

and SWAYAM. The article discussed the challenges associated with implementing MOOCs in India, emphasizing that while MOOCs offer numerous benefits, they cannot fully replace traditional education. A balanced and comprehensive education for today's youth is best achieved through a combination of both conventional and MOOC-based learning approaches.

Kumar et al. (2023) conducted a detailed examination of four established and popular MOOC platforms in India, specifically NPTEL, mooKIT, IITBombayX, and SWAYAM, to analyze and contrast their functionalities, challenges, and overall performance in the Indian educational context. The study revealed that while MOOCs have gained popularity in India, significant challenges affect their effectiveness, including a lack of digital infrastructure, the need for investment, and learners' ability to adapt to the MOOC format. These factors are crucial in determining the effectiveness of MOOCs in the Indian educational landscape. The authors also expressed concerns regarding the potential compromise in the quality of research work produced through MOOCs, emphasizing the necessity to enhance the quality of information generated and to address the diverse needs of Indian students participating in these online courses.

N et al. (2023) investigated the perceptions of students and teachers regarding the effectiveness of massive open online courses (MOOCs) on students' learning efficiency, revealing that both groups generally view MOOCs positively, despite some concerns about cheating and lack of individual attention. The research was conducted at the University of Mysore, utilizing questionnaires and statistical analysis to gather and interpret data from respondents with prior MOOC experience. Findings indicated that while MOOCs have a positive influence on learning efficiency, they are not a substitute for traditional education; however, they can be effectively integrated into a blended learning model. The study emphasized the importance of continuous technological updates for educators and suggested that MOOCs can enhance collaborative learning if implemented thoughtfully.

Panja et al. (2023) conducted a study on the attitudes of students and teachers towards the use of massive open online courses (MOOCs) for academic and

professional development at two national higher educational institutions in India, particularly in the context of the increased interest following the COVID-19 pandemic. A mixed-method approach was employed to gather data, revealing that both groups exhibited a generally positive attitude towards MOOCs, with notable differences in attitudes between the two institutions. The study found that both students and teachers from the two case study sites (CSS1 and CSS2) generally exhibited a positive attitude towards the use of MOOCs for academic and professional development (APD). However, a significant attitude gap existed between CSS1 students and CSS1 teachers, indicating that while both groups had favourable attitudes, the extent of their positivity differed. The research revealed that CSS2 students had a more optimistic attitude towards MOOC usage compared to CSS1 students, while CSS1 teachers displayed a more favourable attitude than CSS2 teachers. This evidence suggested that institutional context plays a role in shaping the attitudes of students and teachers towards MOOCs, with notable differences observed between the two higher educational institutions involved in the study.

Purkayastha and Sinha (2023) focused on the involvement of Central University faculty in designing and implementing MOOCs on the Swayam platform. The study identified key motivating factors such as institutional reputation and personal interest, while also noting significant challenges, particularly a lack of infrastructure. The study found that a total of 26 faculty members from Central Universities are actively offering MOOCs on the Swayam platform. The study showed that the motivations for these faculty members to design and deliver MOOCs include enhancing institutional reputation, fostering a national identity, and personal interest in online education. It was also identified that the successful design of MOOCs includes institutional support, availability of hardware/software resources, adequate time for course design, access to open educational resources (OERs), well-defined learning contents, the instructor's role, course duration, clear objectives, and effective pedagogical approaches. However, a significant challenge faced by faculty was the lack of infrastructure necessary for designing these MOOCs.

Rulinawaty et al. (2023) explored the role of Massive Open Online Courses (MOOCs) in addressing educational challenges during the COVID-19 pandemic,

employing a narrative review approach that highlighted their accessibility, flexibility, and ability to facilitate uninterrupted learning from home. The study emphasized that MOOCs foster self-directed learning, encourage social interaction through forums, and promote continuous skill enhancement, making them a valuable resource for lifelong learning. The study also addressed that while MOOCs are transformative and facilitate affordable distance learning, they cannot fully replace traditional education due to challenges such as limited direct interaction. They should complement existing educational systems, particularly in regions like Indonesia, where they can improve access to education, especially in remote areas. However, equitable quality and widespread internet access remain crucial concerns.

Singh and Kakkar (2023) explored the implementation of inclusive, credit-based SWAYAM MOOCs in higher educational institutions across India, emphasizing their inclusive and credit-based nature, which aims to enhance the quality of education and accessibility for diverse learners. The study highlighted the importance of integrating these MOOCs into the formal education system, enabling students to earn academic credits while promoting lifelong learning and skill development, in line with the National Education Policy. The research findings indicated that the implementation of SWAYAM MOOCs in higher educational institutions has led to an increase in student engagement and participation in online learning, enhancing the overall educational experience and accessibility for diverse learners. The study also emphasized the effectiveness of credit-based SWAYAM MOOCs in providing flexible learning opportunities, allowing students to earn academic credits while balancing their studies with other commitments, thereby promoting lifelong learning and skill development.

Yadav and Khandelwal (2023) conducted “A study on students’ perception and attitude towards MOOCs,” which provides an overview of the factors that influence student attitudes and enrolment in MOOCs. According to the study, personal factors are the primary determinants of success or failure in MOOC completion, with most students expressing a genuine interest in finishing their courses. Students are motivated by the quality of courses, the reputation of universities, and the enjoyment derived from completing challenging assignments. The study did not explore factors

like poor internet connectivity, limited understanding of MOOCs, language barriers, and learning potential. The study's findings revealed that most students perceive MOOCs as an effective tool for their professional development and are interested in incorporating collaborative writing models into their language course design and classroom practices. It was found that female students are more adept at deep learning and feel less intimidated than male students when MOOCs are used in the learning process. Students who enjoy learning and comprehending new concepts are more committed to MOOCs, while those who prefer independent learning show less commitment. The study concluded that a student's perception is significantly influenced by four aspects: E-learner, competency, external influence, system interaction, and social influence. The findings suggest that students have a positive outlook on their courses, with personal relevance, educational value, and life skills being the most significant factors influencing this outlook. Six themes are evident in student attitudes, including reliability, accessibility, content, learning, communication, and outcomes. The study also identified nine demotivating factors contributing to learners not completing a course: difficulty, excessive effort, lack of time, no improvement in their CV, unengaging courses, lack of self-discipline, non-prerequisite courses, poor delivery, and inadequate video content quality. The participants attributed these factors to their inability to complete a course.

Zhang and Zeng (2023) focused on the global landscape of MOOCs, highlighting the correlation between economic development and MOOC offerings, particularly in North America and Western Europe, and discussed the proximity principle in course offerings. The study investigated the global landscape of massive open online courses (MOOCs) by employing complex network analytics, focusing on the diversity and cooperation in course offerings from various universities and colleges, while aligning with the proximity principle and comparative advantage disciplines in development economics. The study highlighted a positive correlation between a region's economic development level and the rate of MOOCs offered, noting that North America and Western Europe maintain substantial advantages, with significant disparities in MOOC development observed across different nations in fields such as computer science.

Bhardwaj and Saxena (2024) conducted a survey on Massive Open Online Courses in social sciences and their implementation at universities in Delhi. The study found varying levels of integration of MOOCs across seven Indian universities, with some institutions exhibiting moderate, low, and very low levels of incorporation into their curricula. This indicated a lack of uniformity in how MOOCs were being adopted and utilized in higher education settings. Six out of the seven institutions employed the strategy of "Explain the perceived usefulness" to enhance the uptake of MOOCs. In comparison, five institutions provided education about different MOOC platforms during information literacy events. However, the study also revealed that a significant number of libraries lacked effective strategies to promote MOOCs, highlighting a gap in support for MOOC learners within the academic community.

2.2. Analysis of the Review of Related Literature

The comprehensive review of existing literature provided a clear overview of both the progress achieved and the persistent challenges faced in online learning at national and international levels. The literature, systematically categorized into themes related to the status, problems and perceptions of stakeholders regarding Massive Open Online Courses (MOOCs), reveals that online learning systems worldwide share many common issues. However, regional contexts often shape the specific nature and intensity of these challenges, particularly in developing countries like India, where factors such as digital infrastructure, language diversity, and cultural relevance significantly impact MOOC adoption and effectiveness. Despite their potential to democratize education and expand access, MOOCs continue to experience challenges such as low learner retention, limited technological access, and varying stakeholder perceptions, which must be addressed to realize their full promise in diverse educational settings.

Table 2.1*Table of Literature Reviewed*

Sl no	Keywords	Research Conducted and Literature	Findings
1	Status of MOOC	McAuley et al. (2010): Examined the MOOC paradigm and global digital learning. Pappano (2012): Assessed worldwide MOOC growth and transformation. Liyanagunawardena et al. (2013): Systematic review of published MOOC research. Rodriguez & Armellini (2013): Evaluated economic implications. Chatterjee Nath (2014): Focused on MOOC outreach in rural India. Kumar et al. (2023): Compared key Indian MOOC platforms. Pant et al. (2021): COVID-19-driven MOOC adoption. Zhang & Zeng (2023): Global MOOC access and networks.	MOOCs disrupt traditional education, expanding access and known for innovation. India is increasingly prominent in global MOOC enrollment or creation. Development and adoption surged during the pandemic. Adaptation and innovation levels differ across regions and institutions.
2	Perceptions	Hill & Barber (2014): Compared MOOC expectations and outcomes. Majid et al. (2019): Analyzed postgraduates' experiences. Yadav & Khandelwal (2023): Surveyed MOOC success determinants.	Accessibility, flexibility, and upskilling are consistent motivators. Barriers: lack of awareness, digital fluency, and platform or institutional support. Positive perceptions among both students and teachers;

		Sharma (2018): Studied rural users require special working professionals' support. perspectives. Differences seen by age, Sanzgiri (2020): Compared experience, and professional Indian and global user role. motivations. Ambadkar (2020): Investigated motivation on SWAYAM. Boardoloi et al. (2020): Exploration of lifelong learning roles. Chauhan & Goel (2017): Platform comparisons and Indian challenges. Banwari (2018): Equity and motivations in rural India. Panja et al. (2023): Student and teacher attitudes toward MOOCs. You (2019): Importance of learning strategies and platform usability. Rienties et al. (2013): Teachers' mindset shifts after MOOC-driven professional development.	
3	Pedagogy	Mullaney (2013): Described instructional diversity and learning theories. Wide range from didactic to collaborative or connectivist learning. Margaryan et al. (2015): Benchmarked instructional quality. Active learning, peer-to-peer, and hybrid models foster higher engagement. Conole (2015): Discussed Innovative methods (e.g.,	

		effective design, challenges (e.g., authentication, cheating, assessment). Fidalgo-Blanco et al. (2016): Explored hybrid (xMOOC and cMOOC) learning models. Milligan & Littlejohn (2014): Learning design for professional engagement in MOOCs. DeBoer et al. (2014): Called for new analytics and evaluation metrics. Ruiprez-Valiente et al. (2016): Compared engagement patterns in xMOOCs vs cMOOCs. Snchez-Vera et al. (2014): VUSSC model for collaborative learning.	social or collab learning, adaptive feedback) can improve experience. Professional learning requires context-specific, responsive design.
4	Problems	Clow (2013): Funnel of participation, causes of learner attrition. Conole (2015): High dropout, recognition, and support at scale. Soni (2015): Problems in e-learning or online education (India). Laxmisha Rai & Deng Chunrao (2016): Analyzed barriers and enablers of MOOC success. Chatti et al. (2018): Forum inactivity and low engagement. Dash & Panigrahi (2022):	Persistent problems: high dropout, lack of support, student motivation decline, limited interactivity. Technical issues, authentication, content localization, challenge of meaningful assessment. Forum under-use and low satisfaction addressed by targeted facilitation and clearer guidance. Tackling regional or language inequity is crucial.

Evaluated strengths and weaknesses of Indian MOOC development.

Kambli (2022): Examined MOOC obstacles in nursing education.

Alyoussef (2023): Studied factors affecting MOOC intention or usage.

Chen (2023): Discussion forum challenges and instructional intervention effects.

Pant et al. (2022): Factors impacting MOOC retention.

Singh & Kakkar (2023): Examined inclusivity and course credit concerns.

The literature on Massive Open Online Courses (MOOCs) demonstrates their transformative potential in higher education through increased access, flexibility, and innovation in teaching and learning. Early studies (McAuley et al., 2010; Pappano, 2012; Daniel, 2012) introduced MOOCs as a transformative model promoting openness and learner autonomy, whereas later studies focused on learner engagement, pedagogical strategies, and course completion challenges (Clows, 2013; Conole, 2013; Liyanagunawardena et al., 2013). Studies in developing contexts, particularly in India, highlight opportunities for educational democratization while also exposing barriers such as inadequate infrastructure, insufficient digital literacy, and limited awareness (Chatterjee & Nath, 2014; Ambadkar, 2020; Banwari, 2018). Recent studies investigate the evolving pedagogical approaches (Fidalgo-Blanco et al., 2016), comparative analyses of platforms (Kumar et al., 2023), motivational factors (Kaveri, 2015; Sharma, 2018), and the impact of the Covid-19 pandemic on MOOC adoption (Shankar & Kallarakal, 2020; Pant et al., 2021). Studies also

emphasize the need for institutional support, learner engagement strategies, and technological innovations to enhance the effectiveness and sustainability of MOOCs.

Some similar findings were identified in the studied literature. MOOCs improve access to high-quality education and lifelong learning worldwide, especially benefiting underserved and rural populations (McAuley et al., 2010; Chatterjee & Nath, 2014; Bordoloi et al., 2020). Engagement of learner presents a significant barrier, as numerous studies indicate high dropout rates and emphasize the necessity of support systems, including social interaction and individualized routes (Clows, 2013; Latha, 2019; Gamage, 2022). The pedagogical quality and instructional design of MOOCs exhibit significant variability, with success frequently associated with the clarity of objectives, interactive content, and effective assessment (Margaryan et al., 2015; Fidalgo-Blanco et al., 2016). Technological infrastructure and digital literacy are significant barriers in developing countries, affecting the adoption and completion rates of MOOCs (Nkuyubwastis, 2014; Ambadkar, 2020; Kumar et al., 2023). MOOCs have demonstrated favourable perceptions among students and teachers, affecting their acceptability and integration into traditional educational systems when supported by policy and institutional frameworks (Kundu & Bej, 2020; Panja et al., 2023).

While some researchers highlight the disruptive potential of MOOCs and their capability to replace traditional education (McAuley et al., 2010; Daniel, 2012), others caution that MOOCs should be regarded as complementary rather than replacements due to limitations in learner support and interaction (Banwari, 2018; Rulinawaty et al., 2023). The effectiveness of MOOCs varies significantly across contexts, the US and Europe benefit from economic advantages and technological readiness, while MOOCs in developing countries encounter systematic challenges that hinder scalability and sustainability (Zhang Zeng, 2023; Nkuyubwatsis, 2014). Gender and demographic factors show mixed effects on MOOC adoption and engagement, with certain research indicating male predominance in participation, while others emphasize superior deep learning capabilities among female learners (Kaveri, 2015; You, 2019; Yadav & Khandelwal, 2023). Discussion on economic sustainability is divided, certain research highlights various monetization strategies

and financial challenges, whereas institutional objectives predominantly emphasize the expansion of educational access over profit generation (Rodríguez & Armellinis, 2013; Hollands & Tirthali, 2014).

2.3. Research Gap

Despite comprehensive studies highlighting the opportunities and challenges associated with MOOCs including increased educational access, flexible learning, and significant barriers in developing countries, several critical gaps remain, especially within the central universities of North East India. There is insufficient investigation of how institutional and governmental policies may effectively support the integration, sustainability, and scalability of MOOCs beyond initial adoption phases. Technical challenges remain regarding the subtle effects of targeted digital literacy initiatives and localized infrastructural improvements; however, empirical evaluations across diverse Indian regions are insufficient. Regarding learner demographics, the influence of factors such as gender, socio-economic status, and academic backgrounds on motivation, engagement, and learning outcomes remains under-explored, particularly in connection with culturally responsive pedagogical designs.

Moreover, the lack of collaboration frameworks among policymakers, educators, and technology hinders the holistic development of MOOCs that are contextually relevant and equitable. Furthermore, studies seldom investigate the long-term integration of MOOCs into existing educational frameworks or evaluate their effects on profound learning and skill development among minority and rural populations. Addressing this gap necessitates context-specific research that integrates quantitative and qualitative methodologies to evaluate the intricate experiences of learners and educators, institutional readiness, and the effectiveness of targeted interventions to optimize the transformative potential of MOOCs in resource-limited environments. Addressing these interconnected gaps is essential to realize the transformative potential of MOOCs as complementary educational tools, ensuring effective policy support, customized technology interventions, and inclusive learner participation in India.

Conclusion

The review of literature on MOOCs reveals a dynamic educational innovation with the potential to revolutionize access to higher education and promote lifelong learning, particularly in diverse and resource-limited contexts such as India. The primary advantages of MOOCs are their scalability, accessibility, and flexibility. Nonetheless, challenges persist in securing learner engagement, pedagogical quality, technology infrastructure, and sustainable institutional support. Evidence indicates that MOOCs are most effective as supplementary resources alongside conventional education rather than as replacements. To realize the full potential of MOOCs, especially in developing contexts, focused efforts are needed to improve infrastructure, raise awareness, customize pedagogies to learner needs, and foster collaborative ecosystems among stakeholders. Future research must investigate innovative technological interventions, policy frameworks, and empirical assessment of learning outcomes to enhance the efficacy and equity of MOOCs in global education.

CHAPTER – III

METHODOLOGY

CHAPTER – III

3.0. METHODOLOGY

The research methodology outlines a scientific and systematic approach to solving a research problem. It thoroughly explains the methods used for data collection and analysis. The methodology of this study outlines a procedure, plan, or design for conducting research, encompassing the research method, population, sampling frame, tools used, data collection procedure, and statistical techniques employed for data analysis. Within this context, the current chapter aims to explain the methodology and procedures used in the study, highlighting key aspects such as defining the population, the reasoning behind sample selection, and the methods applied for this purpose. Furthermore, this chapter provides a clear and detailed description of the methodology for the current investigation, presenting the design in a clear and thorough manner, as research design is regarded as a research protocol designed to ensure optimal control over variables that could potentially affect the accuracy and reliability of the study's results. In the study by Parahoo et al. (2006), research design is described as a specific data collection and analysis plan that outlines the details of when, where, and how data should be collected and processed. Therefore, this highlights that the development of a research design is essential for completing the research process and the methodology of the present study is discussed involving the following heads: -

3.1. Research Method

3.2. Population

3.3. Sample

3.4. Tools used and their construction

3.4.1. Construction of the Tool

3.4.2. Validity of the Tool

3.4.3. Reliability of the tools

3.5. Procedure of Data collection

3.6. Focus Group Discussions (FGDs)

3.7. Data Analysis and Statistical Techniques Used

3.7.1. Quantitative Data Analysis

3.7.2. Qualitative Data Analysis

3.8. Limitations of the Study

3.9. Ethical Principle followed

3.1. Research Method

Choosing an appropriate research method is crucial in any research study. Each problem requires methods suited to achieve specific objectives. While some approaches are valuable, not all methods are suitable for every situation, so the chosen approach must align with the specific issue. Various research methods and techniques exist, depending on the study's nature and goals. Among these, descriptive survey research stands out as one of the most effective methods for social and educational purposes. This design aims to systematically explain or describe a phenomenon through data collection, comparison, measurement, classification, interpretation, and assessment. It provides a comprehensive understanding of issues, leading to potential solutions for social and educational challenges. Best (1977) states that descriptive research offers a detailed account and analysis of current phenomena. This includes existing conditions, relationships, attitudes, ongoing processes, visible impacts, or emerging trends. The primary focus is on the present, although it often considers historical events and their effects in context with contemporary situations.

Consequently, the study was descriptive in nature and mixed method was used to explore the adoption and implementation of Massive Open Online Courses (MOOCs) in the central universities of North East India, with a particular focus on the status, problems, and perceptions of stakeholders related to MOOCs. The variables studied included the adoption of MOOCs, issues related to their design and development, and the different dimensions of both teachers' and students' perceptions of MOOCs, specifically concerning gender, streams of study, and teaching experiences.

3.2. Population

According to Mugenda and Mugenda (2003), a population in statistics refers to the specific group that is the focus of the research. Additionally, Naoum (2007) describes a population as a clearly defined collection of individuals, services, objects, events, or households being studied. The list of respondents from which samples are drawn is called the sampling frame, providing a complete list of every individual in the population.

According to the UGC Annual Report (2022-2023), there are officially 11 central universities across the eight North Eastern states of India (as cited in Daimary, 2024). This total includes nine general central universities managed by the Ministry of Education and two specialized universities governed by other ministries. As a result, all students and teachers at these nine general central universities namely, Rajiv Gandhi University (Itanagar, Arunachal Pradesh), Assam University (Silchar) and Tezpur University (Assam), Manipur University (Imphal, Manipur), North-Eastern Hill University (Shillong, Meghalaya), Mizoram University, (Aizawl, Mizoram), Nagaland University (Lumami, Nagaland), Sikkim University (Gangtok, Sikkim), and Tripura University (Agartala, Tripura), are the population of the study.

3.3. Sample

A sample represents a smaller segment of the overall population, used to gather responses and generate results. An ideal sample size accurately reflects the characteristics of the entire population with minimal deviation from the actual population values. Collecting data from the whole population is often difficult; hence, only a subset of the population has been chosen for the research study.

The study employed two phase sampling procedure:

Phase-1: The researcher purposely selected four central universities in the first phase. The central universities included in the study are - Mizoram University, Nagaland University, Manipur University, and North-Eastern Hill University who had information about MOOC on their university websites.

Phase-2: Purposive sampling method was used to ensure a selection of participants from the four selected central universities. Regarding the student respondents, the total sample size is 320, with each of the central universities contributing 80 participants. Similarly, concerning the teacher respondents, the total size is set at 64 respondents, with each central university contributing 16 participants. The distribution of the students and teachers' respondents is presented in Table 3.1.

Table 3.1

Distribution of the Students and Teacher Respondents according to Universities

S/No.	Name of Universities	No. of Students	No. of Teachers
1.	Mizoram University	80	16
2.	Nagaland University	80	16
3.	Manipur University	80	16
4.	North Eastern Hill University	80	16
Total		320	64

The sample was divided into two subgroups - gender and streams of study for student respondents. A total of 80 students were selected from each university, with gender (Male and Female) and streams of study (Arts and Sciences) as the main variables. Each variable was divided into two equal subgroups: 40 males and 40 females, as well as 40 students from the Arts and 40 from the Sciences. The sampling was organized so that, within each university, 20 male students were chosen from both the Arts and Sciences streams, and 20 female students were also selected from both streams, resulting in 80 students per university.

Similarly, a total of 64 teachers were selected as respondents using purposive sampling procedure to reach the study's objectives. Within each university, the teachers were further classified based on gender, streams of study, and teaching experiences. Specifically, for each university, variable was divided into two equal subgroups: 8 males and 8 females, as well as 8 teachers from the Arts and 8 from the Sciences streams, resulting in 16 teachers per university.

This classification is essential because it recognizes the diverse backgrounds and needs of students and teachers, ensuring the study capture a complete picture of stakeholders' perceptions of MOOCs and their overall status in the central universities of North East India. For clarity, the distribution of teacher and student respondents, based on these variables, is presented in Tables 3.2 and 3.3, respectively.

Table 3.2

Distribution of Students based on Variables

S/No.	Name of Universities	No. of Students	Variables			
			Arts		Sciences	
			M	F	M	F
1.	Mizoram University	80	20	20	20	20
2.	Nagaland University	80	20	20	20	20
3.	Manipur University	80	20	20	20	20
4.	North Eastern Hill University	80	20	20	20	20
Total		320	80	80	80	80

Table 3.3

Distribution of Teachers based on variables

S/No	Name of Universities	No. of Teachers	Variables			
			Arts		Sciences	
			M	F	M	F
1.	Mizoram University	16	4	4	4	4
2.	Nagaland University	16	4	4	4	4
3.	Manipur University	16	4	4	4	4
4.	North Eastern Hill University	16	4	4	4	4
Total		64	12	12	12	12

MOOCs Coordinators or members of the Academic Council were purposely selected because of their typical characteristics of being involved in the adoption and implementation of MOOCs in each central universities of North East India. Once the sample was chosen, data were gathered through separate structured questionnaires given to both students and teachers, covering dimensions such as awareness of MOOCs, motivation for learning through MOOCs, perceived benefits, expectations, challenges, and issues with the design and development of MOOCs. The collected data were then analyzed to draw meaningful conclusions and provide valuable recommendations for improving awareness and usage of SWAYAM-MOOCs among students and teachers in the selected central universities of North East India.

3.4. Tools used for the study

Research tools are instruments used to gather information for a specific research project. To achieve the objectives of the study, the researcher developed the following tools: -

1. A semi-structured interview schedule was developed to study the status, plans and programs, and issues related to MOOC design, development, and implementation in central universities of North East India.
2. Questionnaire was developed to study the issues related to MOOC design, development, and implementation in central universities of North East India.
3. A questionnaire was developed for the students to study their perception of learning through MOOC.
4. The researcher developed a questionnaire to study the perceptions of central university teachers in North East India about the pedagogy and learning design of MOOCs.
5. Focus group discussions were conducted to collect in-depth relevant information.

3.4.1. Construction of the Tool

The development of these tools involved planning phases during which the researcher designed the instrument and its various components. The investigator reviewed literature on perceptions of MOOCs and the status of MOOCs from various journals and research conducted from different perspectives of the population, using both online and offline methods. Statements were developed to cover multiple dimensions, including motivation for learning through MOOCs, perceived importance by MOOC users, benefits of learning through MOOCs, expectations from MOOCs, and challenges faced by MOOC users. The dimensions for teachers' perceptions differed from those for students. To assess teachers' perceptions of MOOCs, multiple dimensions covering the motivation, benefits, and challenges as perceived by the MOOC users were studied as part of the pedagogy of MOOCs. Another dimension covered the perceived learning design, development, and implementation of MOOCs by teachers who experienced MOOC courses. Since three different questionnaires were developed for the study, the list of questions or items varied depending on the specific objectives to achieve.

The first draft was a closed-ended questionnaire assessing issues related to the design, development, and implementation of MOOCs, consisting of 22 Yes or No questions, aiming to determine the current status of MOOCs within the university. Another draft of the questionnaire was developed to assess students' perceptions of MOOCs, divided into two parts - Part A and Part B. Part A includes questions about students' awareness, enrolment status, and opinions on MOOCs. Part B contains items related to motivation, importance, benefits, expectations, and challenges that are intended for those who have enrolled in MOOCs only. This questionnaire has 40 statements rated on a 5-point Likert Scale for agreement - Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), and Strongly Disagree (SD). The third questionnaire was designed to assess teachers' perceptions of MOOCs and was divided into two sections. Part A covered awareness, enrolment, and certificate status of teachers. Part B focused on MOOC pedagogy, evaluating dimensions such as motivation, benefits, and challenges, including learning design, development, and implementation. To address specific objectives, the items were divided into two sets:

the first comprising 25 items and the second comprising 20 items. Both parts used a 5-point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree," similar to the scale used for students' perceptions.

3.4.2. Validity of the Tool

The validation process involved analysing the content of the questionnaire. The researcher drafted the initial questionnaire, which was then reviewed and approved by education experts. Feedback and suggestions for modifications were carefully considered, and the questionnaire was revised based on their input. This process was repeated until both the researcher and supervisor approved the final version, confirming the content validity of the questionnaire. The final version, addressing issues related to the design, development, and implementation of MOOCs, included 24 'Yes' or 'No' items. The students' perceptions questionnaire was finalized with 37 items covering dimensions such as motivation, benefits, importance, expectations, and challenges. Regarding teachers' perceptions of MOOCs, the first part comprised 20 items covering dimensions such as motivation, benefits, and challenges. The second part included 19 items focused on MOOC learning design, development, and implementation. Both the students' and teachers' perception questionnaires were finalized using a 3-point Likert scale, with options for Agreement (A), Disagree (D), and Undecided (U). Furthermore, a semi-structured interview schedule questions was developed by the researcher to complement the findings gathered through the directional quantitative data. The subsequent tables detail the number of items for each dimension for students and teachers.

Table 3.4

Table showing Dimensions and Items of Students' Perception Scale

S/No.	Dimensions	Item number	Total items
1.	Motivation	1 – 7	07
2.	Importance	8 – 13	06
3.	Benefits	14 –18	05

4.	Expectations	19 – 29	11
5.	Challenges	30 – 37	08

Table 3.5

Table showing Dimensions and Items of Teachers' Perception Scale

S/No.	Dimensions	Item number	Total items
A1.	Motivation	1 – 3	03
A2.	Benefits	4 – 13	10
A3.	Challenges	14 – 20	07
B1.	Design	1 – 5	5
B2.	Development and Implementation	6 – 19	14

**For the dimensions and items of the teachers' perception scale, the first part of the item is given as A1-A3 in the serial number, and the second part of the item is shown as B1-B2.*

3.4.3. Reliability of the tools:

After finalization of the tool, the researcher faced the problem of visiting the field due to the COVID-19 pandemic. After the pandemic was over, the researcher administered the tools to 30 students and 15 teachers at Mizoram University. The response was collected from them, and reliability was calculated using the split-half method. The researcher calculated the R-value through Spearman's Rank Correlation Coefficient formula.

$$r_s = 1 - \frac{6 \sum_{i=1}^n d_i^2}{n(n^2 - 1)}$$

Thus, the R-value of both tools was found to be 0.72 and 0.68, respectively. It was concluded that both questionnaires were highly reliable.

3.5. Procedure of Data Collection

After selecting the items and preparing the tools for data collection, the researcher began a comprehensive data-gathering process, visiting various central universities to collect valuable insights for achieving the study's objectives. To ensure a representative sample, the researcher distributed questionnaires to stakeholders at North Eastern Hill University, Nagaland University, Manipur University, and Mizoram University. The questionnaires were administered to a diverse group of participants, comprising both teachers and students from the art and science streams.

A semi-structured interview schedule (open-ended questions) was administered to the MOOCs coordinator or any member of the council at each central university to inquire about the status of MOOCs in the university. The researcher personally approached all potential students and teacher respondents, as well as the MOOCs Coordinator or a member of the council, to gather the necessary data to meet the study's objectives. The nature and purpose of the study were explained to respondents, and clear instructions were provided. Emphasizing there were no time constraints or right or wrong answers, the researcher assured participants that their responses would remain confidential, would be used solely for research purposes, and their identities would be kept anonymous. Participants were encouraged to respond honestly and freely select their answers regarding the status and perception of MOOCs. The researcher waited for their responses and ensured that the tests were administered under optimal conditions. Each session at every central university concluded with an expression of gratitude to the student and teacher respondents. The data collection period was conducted from August 2022 to September 2023.

3.6. Focus Group Discussions (FGDs)

Following the quantitative data analysis, Focus Group Discussions (FGDs) were systematically conducted to obtain deeper qualitative insights into the research findings. Based on the availability and convenience of the participants, these sessions were held in person either after classes or during the evening hours, particularly for

students residing within the campus premises, and were organized according to gender and streams of study to ensure diverse perspectives were captured.

Focus Group Discussions (FGDs) was conducted in all four selected central universities of North East India - Mizoram University, Nagaland University, Manipur University and North Eastern Hill University, exclusively among the students. In each group, researcher has identified 7-10 student respondents to participate in the FGD session conducted.

To obtain a comprehensive understanding of the status, problems and perceptions related to MOOCs among students in central universities of North East India, the investigator developed a structured Focus Group Discussion (FGD) guide. This qualitative tool was developed based on the findings gathered through the quantitative data using the structured questionnaire for assessing student perceptions toward MOOCs. The FGD questions aimed to probe underlying reasons for various dimensions such as perceived motivation, importance, benefits, expectations, and challenges - that quantitative methods alone could not fully capture. As a result, qualitative findings were carefully integrated with quantitative results to achieve triangulation and enhance the validity and interpretive depth of the present study.

Respondents were personally invited to the respective discussion sessions and provided with comprehensive instructions concerning the objectives and procedures of the research study. All insights gathered during these discussions were meticulously recorded by mobile phone of the researcher and analyzed, serving to complement and contextualize the results obtained through the quantitative approach.

Due to the limitations of the study, FGDs were conducted exclusively among student respondents. Nevertheless, comments and observations offered by each teacher respondents through semi-structured interview schedules were thoroughly recorded to further supplement the quantitative findings and to provide a holistic understanding of the status, problems, and perceptions related to MOOCs addressed in the present study.

3.7. Data Analysis and Statistical Techniques Used

3.7.1. Quantitative Data Analysis:

The quantitative research method focuses on collecting hard facts and numerical data. It determines cause-and-effect relationships between variables through statistical and computational techniques. In this study, descriptive statistical techniques, primarily percentages and non-parametric tests, such as the Chi-square, were used to analyse the data.

Percentage: Simple statistical and computational methods, such as percentages, were employed to assess the status and awareness level of MOOCs among the students and teachers. The 3-point Likert scale was used to determine students' and teachers' perceptions of MOOCs, recording tallies for each scale option and calculating the average percentage for each dimension, such as motivation, importance, benefits, expectations, and challenges, to evaluate the students' perception. Additionally, the dimensions include the pedagogy line such as motivation, benefits, and challenges and the learning design, development, and implementation of MOOCs to assess the teacher's perception.

Chi-square: A chi-squared test is a statistical hypothesis test used for analysing contingency tables when sample sizes are large. Essentially, it assesses whether two categorical variables independently affect the test statistic. The test is considered valid when the test statistic follows a chi-square distribution under the null hypothesis, such as in Pearson's chi-squared test and its variants. This test determines if there are significant differences between expected and observed frequencies across categories in a contingency table.

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

In this study, the chi-square test was used to compare the mean percentages across various dimensions for both students and teachers, taking into account factors such as gender, streams of study, and teaching experience.

To achieve the study's objectives regarding students' perceptions of MOOCs, data were initially collected from a total of 354 student respondents across all the

central universities of North East India. However, for the quantitative analysis, the sample was finalized to include 320 students, as responses from the excluded participants were incomplete or improperly filled. The questionnaires collected from the original 354 respondents were carefully screened and filtered to ensure data quality and relevance, thus allowing for accurate and valid analysis aimed at fulfilling the desired research objectives. Similarly, data was gathered from 88 teacher respondents across all the central universities of North East India. However, respondents were carefully screened and filtered to ensure data quality. Furthermore, additional data was purposely gathered through a telephone interview to facilitate a meaningful analysis for achieving the study's objectives, resulting in a final sample of 64 teacher respondents.

3.7.2. Qualitative Data Analysis:

For qualitative analysis of data collected through Focus Group Discussions (FGDs), thematic analysis was employed due to its flexibility and effectiveness in identifying patterns across diverse participant responses. Some verbatim excerpts were also analysed with the help of participants to ensure accuracy and authenticity.

Transcripts were read multiple times to achieve deep familiarization with the data, followed by the inductive generation of initial codes based on recurring experiences, concerns, and perspectives. These codes were then systematically grouped into broader themes that aligned with the study's research objectives. Separate analyses were conducted for homogeneous groups - students, and teachers - to preserve the uniqueness of their perceptions while enabling meaningful comparison.

The resulting themes not only informed the development of open-ended discussion questions but also facilitated the integration of rich qualitative insights into the overall study findings. Participant quotations were incorporated to enhance the authenticity and contextual depth of the analysis. By combining these qualitative themes with quantitative patterns from structured questionnaires, the study applied methodological triangulation, thereby strengthening the credibility and depth of the research conclusions.

3.7. Limitations of the study

Studying the status of MOOCs in the central universities of North East India is a challenging and crucial topic in the present-day scenario. Several limitations arose during the investigation as the study attempted to achieve its objectives.

Initial plans were made to organise focus group discussions with both teachers and students across all the central universities of North East India. However, for teachers, these discussions could not be carried out because of their busy timetables, competing academic responsibilities and difficulties in finding mutually convenient slots. As a result, the collection of qualitative data had to be restricted to interviews conducted at the time of administering the questionnaires.

During these interviews, several difficulties were encountered. Some teachers were highly cooperative, and engaged seriously with the questions, whereas others appeared rushed and were unable to spare sufficient time to discuss issues related to the planning and implementation of MOOCs in their universities. In addition, certain teachers were reluctant to reveal details of their formulated plans and programs, explaining the matters discussed in council or committee meetings were confidential and could not be shared. This lack of disclosure limited the depth and completeness of information required to fully address the study's objectives for each university. In few cases, teachers explicitly requested that the investigator refrain from asking further about their forthcoming plans for the design, delivery, and implementation of MOOCs in the institution.

Furthermore, operational challenges arose during focus group discussions such as time constraints and scheduling inconvenience resulted in unequal levels of students' participation across the selected central universities of North East India.

Due to these limitations, the researcher was unable to obtain satisfactory data during the initial investigation period extending from August 2022 to September 2023. Consequently, additional data was purposely gathered through telephone interviews using a semi-structured interview schedule with teachers from the central

universities of North East India. Each telephone interview had an average duration of approximately 10 to 15 minutes.

3.8. Ethical Principle followed

The present research strictly adhered to established ethical guideline to ensure the rights, dignity, and well-being of all participants. Informed consent was obtained from all participants after providing a clear explanation of the study's objectives, procedures, and potential risks. Participants were entirely voluntary, with respondents given the option to withdraw at any stage without penalty.

Participant anonymity and confidentiality were strictly maintained. All data were securely stored and used solely for academic purposes. The research was designed to minimize any risk or discomfort, and no deceptive practices were employed.

Additionally, all feedback and remarks provided by teachers and students were treated with the utmost respect for privacy and were incorporated into the study only after securing appropriate permissions. These measures were taken in accordance with universally recognized ethical standards, such as beneficence, non-maleficence, integrity and respect for persons.

CHAPTER-IV
ANALYSIS AND INTERPRETATION OF DATA

CHAPTER - IV

4.0. ANALYSIS AND INTERPRETATION

This chapter presents a detailed analysis and interpretation of the data collected in accordance with the research objectives of the study. The aim is to examine the current status, problems, and perceptions of stakeholders related to Massive Open Online Courses in central universities of North East India by systematically analyzing both quantitative and qualitative data. The analysis had been carried out thematically, corresponding to each research objective, in order to provide clarity and coherence. Tables, figures, and excerpts from group discussions were used where necessary to support the findings and to provide a comprehensive understanding of the issues explored. The interpretations were made in light of the regulations and guidelines given by University Grants Commission, including the existing educational context and are intended to highlight significant patterns, trends, and challenges observed during the study.

4.1. Analysis and Interpretation of Objective 1

Objective 1: *To assess the status of MOOCs in central universities of North East India.*

Massive Open Online Courses (MOOCs) have emerged as a transformative and innovative trend in higher education, providing accessible, flexible, and expandable learning opportunities worldwide. In India, the national regulatory frameworks established by the UGC and AICTE, supported by the SWAYAM platform, have encouraged the adoption and integration of MOOCs in higher education institutions. To assess the status of MOOCs in central universities of North East India, both quantitative and qualitative analyses of data had been conducted to produce the findings of the study. The first part of objective no.1 included statistical analysis, graphical representation, and interpretation of the quantitative data collected through closed-ended questionnaires from students and teachers covering their demographic profiles, the total number of stakeholder respondents, awareness levels of MOOCs among students, the enrolment status of students and teachers on

MOOCs, their source of knowledge of MOOCs, and teachers' experiences with MOOCs used to assess the status of MOOCs in these universities. The second part of objective no.1 included qualitative data collected through a semi-structured interview schedule, which was further validated through triangulation with a closed-ended questionnaire to identify key insights in line with the regulations and guidelines of the UGC (*Credit Framework for Online Learning Courses through SWAYAM*) Regulations 2016 and 2021, AICTE (*Credit Framework for online learning courses through SWAYAM*) Regulations 2016, and SWAYAM (guidelines of 2017). This approach aimed to assess the status of MOOCs at four central universities in North East India: Mizoram University, Nagaland University, North Eastern Hill University, and Manipur University of North East India.

Part-I. Descriptive Statistics of Quantitative Data:

The demographic profile of students and teachers of the central universities of North East India and the status of their awareness level of MOOCs were tabulated as follows:

Demographic profile of Student respondents:

To assess the awareness level of MOOCs among students, the study collected data from 320 surveyed students to examine their understanding of MOOCs at four central universities of North East India. The data regarding the students' awareness and enrollment in MOOCs are presented in Tables 4.2 and 4.3, respectively. The questions explored various aspects, including the different sources of knowledge that students rely on to understand MOOCs, and the educational platforms they are aware of.

Table 4.1*Total Number of Student Respondents*

<i>Variables</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
<i>Arts</i>	80	80	160
<i>Science</i>	80	80	160
<i>Total</i>	160	160	320

The table above indicates the overall number of student respondents collected by the researcher. Table 4.1 clearly shows that out of 320 respondents, 80 males and 80 females were selected from both streams of studies, totaling 160 males and 160 females, with 160 Arts and 160 Sciences student respondents.

Table 4.2*Total Number of Student Respondents who know MOOCs*

<i>Variables</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
<i>Arts</i>	34	86	120 (60.9)
<i>Science</i>	49	28	77 (39.1)
<i>Total</i>	83 (42.1)	114 (57.9)	197 (61.6)

**Numbers in bracket indicate percentages*

The results from Table 4.2 showed that out of the 320 surveyed students, 197 respondents, with 61.6%, were aware of MOOCs. Out of the 197 respondents who were found to have awareness of MOOCs, 60.9% (120) student respondents were from the arts streams, while 39.1% (77) were from the sciences stream. Moreover, the findings of the study also highlighted that out of the 197 respondents, 57.9% (114) were females and 42.1% (83) were males.

From these findings, it can be seen that more than half of the surveyed students in the central universities of North East India were found to be aware of MOOCs. The students from arts were found to be more aware of MOOCs than

sciences students, and that female students were more aware of MOOCs than their male counterparts.

Table 4.3

Total Number of Student Respondents Enrolled in MOOCs

<i>Variables</i>	<i>Male</i>	<i>Female</i>	<i>Total</i>
<i>Arts</i>	8 (2.5)	20 (6.3)	28 (8.8)
<i>Science</i>	22 (6.9)	15 (4.7)	37 (11.6)
<i>Total</i>	30 (9.4)	35 (10.9)	65 (20.3)

**Numbers in bracket indicate percentages*

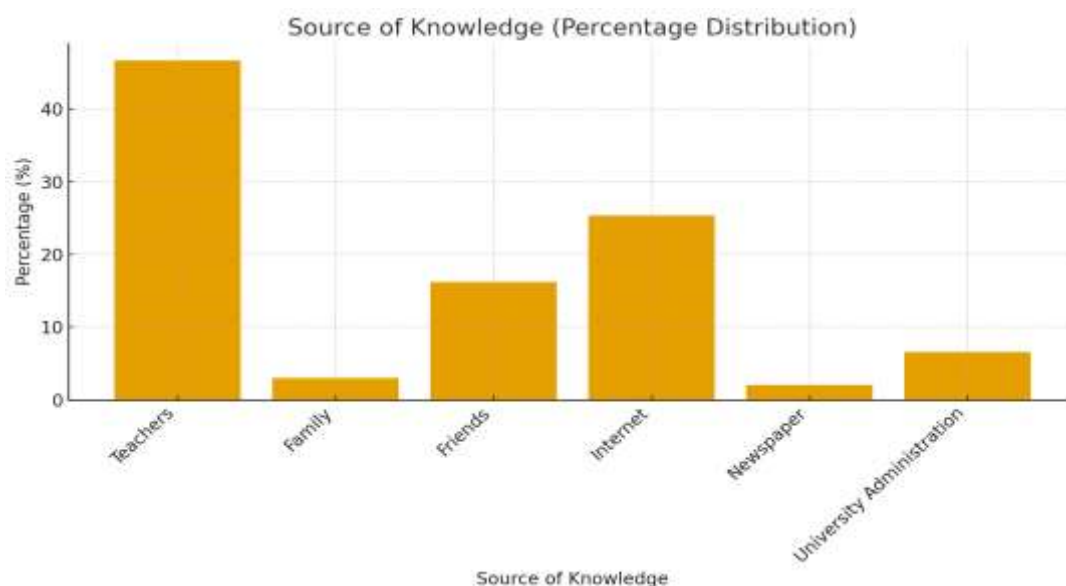
From Table 4.3, it can be seen that, 65 (20.3%) out of the 320 surveyed students had enrolled in MOOCs, with 10.9% (35) being female and 9.4% (30) being male. Moreover, with regards to the streams of study, 11.6% (37) were from the sciences stream, while 8.8% (28) of the students enrolled in MOOCs were from the arts stream. Overall, the findings of the study suggested a low enrollment rate in SWAYAM-MOOCs in the central universities of North East India.

Table 4.4 presents the overall sources of knowledge about MOOCs among student respondents and their graphical representation in Figure 4.1:

Table 4.4

Students' Source of Knowledge

<i>Source of Knowledge</i>	<i>Total</i>	<i>Percentages</i>
Teachers	92	46.7
Family	6	3.04
Friends	32	16.24
Internet	50	25.38
Newspaper	4	2.03
University Administration	13	6.59
Total	197	100

Figure 4.1*Source of Knowledge*

From the comprehensive analysis presented in Table 4.4, it is evident that out of 320 student respondents, a significant 61.6% (197 students) possess awareness of MOOCs (Massive Open Online Courses). The channels through which these students acquired their knowledge include various influential sources such as teachers, family members, friends, the internet, newspapers, and university administration. Among these sources, it was found that teachers emerged as the most prominent influence, particularly concerning both male and female students enrolled in the arts and sciences streams.

The findings of the study showed that 46.7% (92 students) of the 197 respondents specifically identified teachers as their primary source of information regarding MOOCs. This statistic highlights the pivotal role of teachers in promoting students' awareness of the importance, benefits, and potential career opportunities associated with MOOCs within the educational environment. Following teachers, the internet was found to rank as the second most significant source of knowledge, with 25.38% (50 students) attributing their understanding of MOOCs to online resources. This highlights the growing impact of digital platforms in educating students about

educational innovations, such as MOOCs. The present study also revealed that 16.24% (equivalent to 32 students) relied on their friends as their primary source of information about Massive Open Online Courses (MOOCs). This finding highlights the significant impact that peer groups have on both knowledge acquisition and the development of understanding in the contemporary educational landscape. The data illustrated in the table indicates that the university administration, with 6.59% (13 students) holds a significant position among various sources of knowledge, ranking fourth. The study also found that family comes next in this hierarchy, with 3.04% demonstrating its role in knowledge sharing. On the other hand, the study showed that newspapers are positioned at the bottom, with 2.03% suggesting a lesser influence in this context

Table 4.5

Students' Awareness of Online Educational Platforms

Online Educational Platforms	Total	Percentages
Udemy	54	16.9
Swayam	101	31.6
Udacity	24	7.5
OpenLearn	33	10.3
Coursera	44	13.8
FutureLearn	17	5.3
edX	26	8.1
NPTEL	48	15

The table above shows the overall awareness of student respondents regarding online educational platforms, where students were asked to provide their responses for each platform with which they were familiar. Thus, the presented data illustrate the responses given by all student respondents. As indicated in the table above, it was found that SWAYAM, with 31.6%, was considered the most popular among the listed educational platforms. Following that, Udemy, NPTEL, and Coursera were the most popular among the respondents, receiving 16.9%, 15%, and 13.8% of the votes, respectively. OpenLearn was known to 10.3% of the

respondents. The present study also revealed that the respondents recognized other educational platforms, indicating a broader awareness of online learning options. To gain deeper insights into the effectiveness and experiences associated with these platforms, it would be beneficial to conduct a comprehensive assessment by administering a test to the enrolled students of each online educational platform identified in this study. This approach would provide valuable data on student performance and satisfaction across various educational settings.

Demographic profile of the Teacher respondents:

To assess the awareness level of MOOCs among teachers, the study collected data from 64 surveyed teachers to examine their understanding of MOOCs at four central universities of North East India. The data regarding the teachers' awareness and enrollment in MOOCs are presented in Tables 4.6 and 4.7, respectively.

Table 4.6

Total Number of Teacher Respondents and their Awareness Status of MOOCs

S/No	Name of Universities	No. of Teachers	Variables			
			Arts		Sciences	
			M	F	M	F
1.	Mizoram University	16	4	4	4	4
2.	Nagaland University	16	4	4	4	4
3.	Manipur University	16	4	4	4	4
4.	North Eastern Hill University	16	4	4	4	4
Total		64	16	16	16	16

Table 4.7*Total Number of Teacher Respondents Enrolled in MOOCs*

Variables	Teaching experience						Grand Total
	Below ten years			Above ten years			
	Male	Female	Total	Male	Female	Total	
Arts	-	5	5	9	2	11	16 (25)
Sciences	-	1	1	10	-	10	11 (17.2)
Total	-	6	6 (9.4)	19	2	21 (32.8)	27 (42.2)

**Number in brackets indicate percentages*

The results from Table 4.6 showed that all the 64 teachers surveyed (100%) in the central universities of North East India were aware of MOOCs. Out of the 64 teacher respondents, it can be seen that 42.2% (27) had enrolled in MOOCs, with 29.7% (19) being males and 12.5% (8) being females, which is given in Table 4.7. The results also showed that 25% (16) who had enrolled in MOOCs were from the arts streams, and 17.2% (11) were from the sciences streams. Moreover, the findings of the study also highlighted that 32.8% (21) were those having more than ten years of teaching experience, while only 9.4% (6) teachers who had enrolled in MOOCs were those having ten years below teaching experience.

Overall, the findings of the study suggested that despite the widespread awareness of MOOCs, there was a low enrolment rate of teachers in SWAYAM-MOOCs in the central universities of North East India. The findings showed that among the teacher respondents, a higher number of arts teachers enrolled in MOOCs than sciences teachers. It was also found that a higher number of male teachers enrolled in MOOCs than their female counterparts. Furthermore, teachers with above ten years of teaching experience (32.8%) enrolled in MOOCs in higher number than their counterpart with below ten years of teaching experience (9.4%).

Additionally, 15 out of the 64 teacher respondents (23.4%) were found to obtain their online learning completion certificate.

Part-II. Qualitative Data Analysis:

In a study by Richard et al. (2013), a definition of the meaning of qualitative data was provided. According to him, “Qualitative data, or descriptive data, is a non-numerical form of information that describes concepts and opinions. It is merely the process of analyzing qualitative data in order to explain a particular phenomenon. Qualitative data analysis provides us with an understanding of our research objective by revealing patterns and themes in our data. Examples of qualitative data include interview transcripts, audio and video recordings, and field notes.” (as cited in Bhaskar, 2024, p. 135)

The researcher analyzed the regulatory frameworks and guidelines established by the UGC and AICTE for the effective adoption of SWAYAM-MOOCs in all higher education institutions across the country, as published and outlined in the official Gazette of India notifications issued on 19th July 2016, 17th August 2016, and 25th March 2021, respectively. Accordingly, with the establishment of the said foundation, it is essential to understand these regulatory frameworks, as they are vital for guiding the integration, adoption, and execution of MOOCs in higher education, especially within central universities of North East India. To assess the implementation status of MOOCs at Mizoram University, Nagaland University, North Eastern Hill University, and Manipur University, the present study considers the UGC *Credit Framework for Online Learning Courses through SWAYAM*, Regulations of 2016 and 2021, the AICTE *Credit Framework for Online Learning Courses through SWAYAM*, Regulations of 2016, and the SWAYAM Guidelines of 2017, which collectively provide the legal and structural basis for incorporating online learning into traditional curricula. The principal directives and operative features related to academic bodies, infrastructure, and personnel necessary for the successful deployment of MOOCs are highlighted as follows:

A.) SWAYAM based online credit courses: Concerning *Credit Framework for Online Learning Courses through SWAYAM*, the UGC, after the implementation of NEP, 2020, has taken the following initiative: In exercise of powers conferred by sub-section (1) of section 26 read with clause (j) of section 12 of the University Grants Commission Act, 1956 (3 of 1956) and in supersession of the UGC *Credit Framework for Online Learning Courses through SWAYAM, Regulations, 2016*, the University Grants Commission *Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds, Regulations, 2021*, notified on 25th March, 2021, issued in the Gazette of India, under its Regulation (4) states:

1. The schedule of the SWAYAM-based online credit courses shall be aligned with the conventional education semester commencing in the month of January and July of every year.
2. The online credit courses offered through SWAYAM shall be developed, delivered, and assessed only by the course coordinator.
3. The course and course Co-Ordinator shall be identified by the National Co-Ordinator in accordance with the SWAYAM guidelines with the prior approval of the SWAYAM Board.
4. The Course Co-Ordinator shall offer the SWAYAM based online credit courses through the Host Institution (Institution duly recognized by the regulatory authority to which the course-coordinator belongs), which shall issue the certificate with grades after the end-term examination for credit transfer.
5. The list of online credit courses shall be notified on the SWAYAM platform before the 1st November for the January semester and before the 1st June for the July semester, every year.
6. All Higher Education Institutions (HEIs) within four weeks from the date of notification shall decide upon the courses which they may offer

through the SWAYAM platform keeping in view their academic requirements as well as credit transfer.

7. Provided that the Institution may allow only up to 40% of the total courses being offered in a particular programme in a semester, through the online credit course, through the SWAYAM platform.
8. The Academic Council may expedite the process of transfer of credit earned by the student at their parent institution on the basis of the recommendations of the Dean (Academics)/Chairman, BOS and the Head of the Department.
9. For the smooth conduct of credit courses offered on the SWAYAM platform, the parent institution shall ensure that the physical facilities, like laboratories, computer facilities, library, etc., essential for pursuing such courses shall be made available for free and in adequate measure.
10. The parent institution shall designate a faculty member as a facilitator to guide the students from registration till completion of the credit course.

B.) Online Courses Under SWAYAM: MOOCs are such online courses that are developed as per the pedagogy stated in the guidelines and following the four-quadrant approach. The UGC *Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds*, Regulations, 2021, under Regulation (3) read with clause (h) of sub-regulation (1), means the e-learning system that has the following components:

- i. Quadrant-I is an e-Tutorial containing video and audio content in an organized form, animations, simulations, and virtual labs.
- ii. Quadrant-II is e-Content containing e-Books or glossary, case study, frequently asked questions, transcriptions of video lectures, and any other study materials.
- iii. Quadrant-III shall be a discussion forum for clarification of doubts, seeking opinions, and comments with course coordinators and others.

- iv. Quadrant-IV shall be a self-assessment process that shall contain multiple-choice questions, problems, quizzes, assignments, and solutions.

Using the UGC and AICTE regulations and guidelines, supported by the SWAYAM platform, as benchmarks for the present study, data were collected through interviews with MOOC Co-Ordinators and questionnaires distributed among stakeholders to assess the current status and success of implementing MOOCs in central universities of North East India. The specific status of MOOCs in each of these central universities of North East India is highlighted as follows:

Status of MOOCs at Mizoram University:

Despite the increased awareness of Massive Open Online Courses (MOOCs) within the institution, feedback on Mizoram University's status as a Host Institution was assessed as fairly satisfactory, with scope for further improvement. In 2018, Ministry of Education, Government of India, sanctioned a National Resource Centre to the Department of Education, Mizoram University, for the development of MOOC courses under the Pandit Madan Mohan Malavya National Mission on Teachers and Teaching (PMMMNTT) for the Annual Refresher Programme in Teaching (ARPIT). Under this initiative, the Department developed 40 modules on Research Methodology in Education, which were uploaded on the SWAYAM platform as a non-credit MOOC course.

However, based on interview data, participants perceived several shortcomings in essential infrastructure, particularly the lack of dedicated facilities, inadequate recording studio provisions, and a shortage of trained staff to manage MOOC operations and course delivery. Additionally, interview evidence indicated that the university had not offered any MOOC credit courses under SWAYAM through its faculty and relied primarily on external platforms. In response to these challenges, the minutes of the 48th meeting of the Academic Council, AC:47:4(17) recorded a resolution approving the introduction of a SWAYAM Course as a compulsory paper in place of the Interdisciplinary Minor (IMN) course across both semesters, effective from the 2025-26 Academic Session. The course was approved to carry two credits, as noted by the respondent.

Status of MOOCs at Nagaland University:

Despite the growing awareness of Massive Open Online Course (MOOCs), interview data indicated that the status of SWAYAM-MOOCs at Nagaland University was perceived as unsatisfactory. Participants reported that the university did not function as a Host Institution for offering MOOC courses through the SWAYAM platform. Interview evidence further suggested the absence of dedicated infrastructure, such as recording studios or specialized facilities, which are considered essential for the effective management and implementation of MOOC operations.

In addition, participants indicated that the university had not offered any MOOC courses under SWAYAM through its own faculty and relied primarily on external platforms. Respondents also stated that students were encouraged to enroll in courses available on the SWAYAM-MOOCs portal for online learning, which had been operational for approximately four years. However, despite such encouragement, student participation remained limited. Regarding enrollment patterns, respondents indicated that approximately fifty-five students typically registered on the SWAYAM portal during their third and fourth semesters.

Status of MOOCs at North-Eastern Hill University:

Interview data indicated that the status of North-Eastern Hill University was assessed as moderately satisfactory as they had established the necessary provisions for functioning as a Host Institution for SWAYAM-MOOCs since the 2022-23 academic year. These provisions included essential infrastructure such as recording studios, equipment, facilities, and support personnel for the effective implementation and operation of MOOC courses. The university was at the initial stage of providing and delivery of MOOC courses. However, when asked about student enrollment in MOOCs, respondents were unable to provide precise figures, as MOOCs related activities were managed independently by different departments.

With regard to the number of MOOC courses offered, respondents noted that only two courses had been planned for introduction under the SWAYAM-MOOCs

framework. Additionally, respondents further commented that the availability of additional courses would depend on curriculum development processes, while the specific courses offered would be influenced by faculty areas of specialization. Respondents also emphasized that the nature and number of MOOC courses may vary across departments.

Status of MOOCs at Manipur University:

Interview data indicated that the growth of Massive Open Online Courses (MOOCs), particularly SWAYAM-MOOCs, at Manipur University reflected a strong institutional commitment to the initiative and was assessed as highly satisfactory. Participants reported that the university functioned as a Host Institution for offering SWAYAM-MOOC courses through the Educational Multimedia Research Centre (EMMRC), one of the twenty-two media centres established on campus by the University Grants Commission. The availability of well-developed facilities, including recording studios, infrastructure, faculty expertise, and support personnel, was perceived to have effectively supported the implementation, management, and operation of MOOC courses.

An interview with the MOOC Coordinator revealed that student enrolment in the SWAYAM-MOOCs offered through the Educational Multimedia Research Centre (EMMRC) had exceeded 100,000 learners. Moreover, respondents reported that the university had actively contributed to MOOC development, having launched a total of 78 courses under the SWAYAM platform as of January 2024.

Furthermore, interview evidence suggested that the design, development, and delivery of MOOC courses at Manipur University were aligned with UGC *Credit Framework for Online Learning Courses through SWAYAM* Regulations (2016) and the SWAYAM Guidelines (2017). In this context, the MOOC Coordinator commented as follows:

“The university adopted a four-quadrant approach, combining video lectures, reading materials, quizzes, and discussion forums. For example, in our anthropology program, we consulted experts from Manipur University,

as well as from colleges that offer anthropology courses. Based on their input, we developed a syllabus. Using that syllabus, we recreated the entire video content, which allowed us to launch these courses on SWAYAM. So far, we have launched around 60 courses on SWAYAM, some of which have been rerun. For instance, we have a course called Educational Technology that we have run four or five times already on SWAYAM. This course is offered during two semesters: one in January and the other in July, which is why we have rerun it multiple times. So far, approximately 10,000 students have enrolled in this very popular course.”

When asked about the course credits, the respondent furthermore commented and gave her remarks as follows:

“Regarding staff members for this course, we have seven staff members. When producing the course, we needed an entire team for the production. The most important member was the subject expert. She was responsible for writing the course materials and presenting in front of the camera. There are also individuals who edit the recorded videos. When creating a course, we have to specify how many credits it will carry. For example, for a one-credit course, we typically offer 10 lectures, for a two-credit course, 20 lectures, and for the Educational Technology course, we produced 30 lectures, which correspond to three credits. The expert wrote all the materials and provided them in a four-quadrant format for the entire 30 lectures. We compiled this information to create the course and then offered it on SWAYAM.”

Based on the remarks and comments of the MOOC Coordinator at Manipur University, the study concluded that alignment of the UGC *Credit Framework for Online Learning Courses through SWAYAM* Regulations (2016) and the SWAYAM Guidelines (2017) with the regular curriculum contributed to maintaining the quality of education delivered through the MOOC courses on the SWAYAM platform.

The overall status of MOOCs in the central universities of North East India is highlighted in Table 4.8 as follows.

Table 4.8

Overall Status of MOOCs in Central Universities of North East India

Sl No	Name of the University	Host Institute	No of Courses Developed	Academic council Resolution	Offered Courses	Enrolment	Certification
1	Mizoram University	√	40 modules, non-credit course	√	√	√ (SWA YAM portal)	NTA
2	Nagaland University	No	Nil	No Information	Nil	√ (SWA YAM portal)	NTA
3	NEHU	√	Credit course	No Information	√	√ (SWA YAM)	NTA
4	Manipur University	√	78 courses, credit course	No Information	√	√ (SWA YAM)	NTA

4.2. Analysis and Interpretation of Objective 2

Objective 2: *To examine the plans and programmes formulated by the central universities of North East India to implement MOOCs in their university.*

To examine the plans and programmes formulated by the Central Universities of North East India for the implementation of MOOCs, qualitative data were collected through interviews using open-ended questions. These interviews were administered to MOOC Coordinators, faculty members, and other relevant officials of the central universities included in the study. In addition, institutional documents such as Academic Council minutes were consulted to supplement interview data.

Interview evidence and documentary analysis suggested that all four central universities included in the study had received approval from their respective Academic Councils to implement MOOCs in accordance with the University Grants Commission's *Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds*, Regulations, 2021. Consequently, the primary plans and programmes formulated by the universities focused on organizing awareness programmes, arranging teacher and support personnel, establishing studio facilities, and developing the required infrastructure for MOOC implementation. The plans and programmes adopted by each university are discussed below:

Mizoram University:

In the case of Mizoram University, information related to MOOC implementation was obtained from the Academic and Conference Section of the university. Documentary evidence indicated that during the 31st meeting of the Academic Council held on 25th November 2016, the Council resolved to approve the implementation of the UGC-*Credit Framework for Online Learning Courses through SWAYAM*, Regulations, 2016, with effect from the subsequent academic session. Furthermore, the minutes of the 33rd meeting of the Academic Council held on 7th December 2017, with reference to the meeting minutes page 22, AC:33:4(11), recorded approval, in principle, for the introduction of Massive Open Online Courses (MOOCs) in undergraduate and postgraduate programmes, subject to certain

modifications discussed during the meeting. The resolution proposed that a minimum of two MOOCs be made compulsory, preferably in the second and third semesters, with credit limits specified under the Choice Based Credit System (CBCS). Regarding credits, it should not be more than 2 credits (for 6 months course) and 4 credits (for 1 year course), with a minimum of 4 credits and a maximum of 8 credits, be given in addition to the regular credits under CBCS specified for the particular course.

Interview data suggested that although policy approval was granted earlier, full-fledge adoption and integration of MOOCs commenced from the 2025 academic session. Respondents indicated that postgraduate programmes across nine schools of the university had registered for SWAYAM courses during this period.

Regarding plans and programs, the Faculty Development Centre, under the School of Education, had conducted two workshops on designing and developing MOOC courses. Similarly, the School of Education at Mizoram University had conducted a seminar on MOOC design, development, and delivery in collaboration with National Institute of Educational Planning and Administration (NIEPA).

With regard to capacity-building initiatives, respondents reported that the Faculty Development Centre under the School of Education had conducted two workshops on the design and development of MOOC courses. In addition, the School of Education organized a seminar on MOOC design, development and delivery in collaboration with the National Institute of Educational Planning and Administration (NIEPA).

Furthermore, during interviews with the Head of the Department of Education, reference was made to the establishment of a National Resource Centre under Pandit Madan Mohan Malivya National Mission on Teachers and Teaching (PMMMNTT). Respondents noted that the centre had developed forty videos and forty e-learning materials for a non-credit MOOC course under the Annual Refresher Programme in Teaching (ARPIT) for in-service higher education teachers, administered by the Ministry of Education, Government of India.

Nagaland University:

In the case of Nagaland University, interview data suggested that the university was not functioning as a Host Institution for MOOCs at the time of the study, which limited the scope for full-fledge implementation. However, respondents indicated that preliminary planning was underway to enable students to enroll in MOOC courses in the near future. According to one respondent, the immediate institutional plan focused on raising student awareness of MOOCs through regular seminars conducted four times a year – twice per semester.

Additionally, it is worth noting that university officials had initiated seminars and workshops to formulate long-term strategies for MOOC implementation. Despite the absence of studio facilities, dedicated infrastructure, and trained personnel or staff members, respondents reported that efforts were made to familiarize students with MOOCs by facilitating their registration on the SWAYAM portal.

North-Eastern Hill University:

Interview data suggested that MOOCs were formally introduced at North-Eastern Hill University during the 2022-2023 academic years, preliminary discussions and planning had begun prior the Covid-19 lockdown in 2020. Respondents reported that efforts were underway to establish the university as a Host Institution, and a dedicated studio for MOOC development had been set up, along with the necessary infrastructure, staff, and other personnel for recording and reviewing course content.

Participants reported that the Department of Science was among the first to begin recording and offering MOOC courses, while other departments, including the Department of Education, were in various stages of development. At the time of data collection, respondents noted that the Department of Education was in the process of developing its first two SWAYAM courses and had yet to officially offer MOOCs. In contrast, other departments had begun running their respective programs.

Regarding student sensitization strategies, respondents reported that initiatives were taken to inform students about MOOCs during orientation,

emphasizing the opportunity to earn additional credits. Regular updates were also provided at the beginning of each academic year. Furthermore, programs such as seminars and conferences related to MOOC awareness were also conducted. Measures had also been taken to include teachers in this regard, through initiatives such as faculty workshops, as well as encouraging them to enroll in online courses to promote MOOCs and for better understanding. Consequently, respondents further commented that a total of fourteen seminars, workshops, and faculty training programmes had been organized to date. However, precise data on student enrollment across departments were not readily available.

Manipur University:

Data collected through interview evidence reported that Manipur University had established a comparatively advanced framework for MOOC implementation through the Educational Multimedia Research Centre (EMMRC). Respondents reported that the university possessed well developed infrastructure, including a dedicated building for MOOCs, recording studios, recording gadgets, and specialized personnel such as MOOC faculty members, subject experts, presenters, editors, and production teams. Participants also indicated that faculty members from other universities collaborated in the development of MOOC materials.

Respondents further reported that workshops and seminars were regularly organized to create awareness among faculty members and students, ensuring adherence to University Grants Commission guidelines. Although the university had already launched several MOOC initiatives, respondents indicated that further expansion was contingent upon the availability of additional funding, which was viewed as essential for sustaining and scaling MOOC development.

In addition, interview data suggested that the MOOC Coordinator had conducted lectures and training session on the integration of technology in education, MOOC development processes, and compliance with regulatory requirements, including proposal submission, expert review, and alignment with UGC standards. Despite the impressive initiatives already taken at the university, respondents emphasized the need for further improvements in staff organization, course

availability, credit transfer mechanisms, and alignment with Ministry of Education guidelines.

Conclusion:

The findings indicated that all the Central Universities of North East India included in the study had formulated plans to introduce and expand MOOC offerings. Common initiatives across universities included the organization of seminars, conferences and faculty training programmes to sensitize teachers and students to MOOCs. All universities had secured Academic Council approval to incorporate MOOC courses, typically carrying two credits, within postgraduate curricula.

Mizoram University formally integrated MOOC courses into its postgraduate programmes from the 2025-26 academic sessions and developed forty MOOC modules on Educational Research for in-service teachers. In contrast, Nagaland University had not developed faculty-led MOOC courses at the time of the study, although awareness initiatives were underway. North-Eastern Hill University and Manipur University had developed and offered MOOC courses that were available on the SWAYAM platform, with Manipur University demonstrating comparatively advanced infrastructure and institutional capacity.

4.3. Analysis and Interpretation of Objective 3

Objective 3: To reveal issues in connection with the design, development, and implementation of MOOCs in central universities of North East India.

To address objective no.3, which aims to identify issues concerning the design, development, and implementation of MOOCs in central universities of North East India, specific questions were posed to the selected teacher respondents of the four central universities visited by the researcher.

The issues relating to the design of MOOCs by the teachers in their universities are given in Table 4.9

Table 4.9

Issues with the Designing of MOOCs

Sl no.	Issues with the Design of MOOCs	Yes		No	
		n	%	n	%
1.	Are you aware of Massive Open Online Course?	64	100	0	0.0
2.	Have you prepared any MOOC courses?	5	7.8	59	92.2
3.	Does your institution have a supporting staff for developing and providing MOOCs?	9	14.1	55	85.9
4.	Are you trained in designing and developing MOOCs?	5	7.8	59	92.2

The given data represent the responses regarding the issues with the design and provision of MOOC courses in the central universities of North East India. The findings revealed a high level of theoretical awareness about MOOC courses, but a very low level of actual participation, involvement, training and institutional support for the proper and smooth operation of MOOCs among teachers. Majority (92.2%) had neither prepared nor created MOOCs and had not received any training for designing and developing MOOCs, respectively. This is evident in the given data, where 85.9% had reported the lack of institutional support staff for developing and

providing MOOCs, while only 14.1% reported having the required supporting staff for designing and developing MOOCs. This indicated a gap between the awareness level of MOOCs and the actual involvement of teachers due to a lack of institutional support.

The issues relating to the development of MOOCs in the central universities of North East India are represented as given in the following table 4.10.

Table: 4.10

Issues with the Development of MOOCs

S/No.	Issues with the Development of MOOCs	Yes		No	
		n	%	n	%
5.	Does your institution offer a regular MOOC course?	7	10.9	57	89.1
6.	Is your institution equipped with the necessary infrastructure to run MOOCs?	6	9.4	58	90.6
7.	Do you think the MOOC course provided by your institution is developed based on the four quadrants, i.e., e-tutorial, e-content, discussion forum, and assessment?	8	12.5	56	87.5
8.	Does your institution provide any skill-based courses on SWAYAM-MOOC?	7	10.9	57	89.1
9.	Have you encountered any issues with Nodal Institutions when uploading MOOCs?	0	0.0	64	100
10.	Are there students enrolled in SWAYAM-MOOCs provided by your institution?	7	10.9	57	89.1
11.	Is there any appropriate feedback mechanism for MOOCs from the students?	7	10.9	57	89.1

The given data reflects the key challenges in the development of MOOCs across the four central universities of North East India. The findings showed that one major significant issue reported by the teacher respondents is the lack of necessary

infrastructural equipment for developing MOOCs as per the UGC Regulations 2016. Majority (90.6%) of respondents indicated inadequate institutional infrastructure for running MOOCs, and 89.1% confirmed that MOOCs are not integrated as regular courses. Furthermore, the absence of skill-based offerings on SWAYAM and low student enrollment is another significant challenge, with 89.1% of teacher respondents reporting issues. Additionally, 87.5% reported that available MOOCs fail to incorporate essential components like e-tutorials, e-content, discussion forums, and assessments, compounded by a lack of dedicated staff for course development, leading faculty to rely directly on SWAYAM portal registrations.

One respondent noted:

“One issue arises regarding the student’s enrollment in the courses developed, as students are not sufficiently aware of the MOOC courses.”

Another respondent stated:

“As for any challenges we faced while developing MOOCs, initially, there were some hiccups. But, as we continued, it became easier to manage. However, the ministry also issues different guidelines from time to time, which can complicate matters.”

The issues related to the implementation of MOOCs in the central universities of North East India are given in Table 4.11 as highlighted under:

Table 4.11

Issues with the Implementation of MOOCs

S/No.	Issues with the Implementation of MOOCs	Yes		No	
		n	%	n	%
12	Is your institute a host institute for offering MOOC courses and conducting examinations?	5	7.8	59	92.2
13	Is there any student who graduated from the MOOC course provided by your institution?	3	4.7	61	95.3

14	Are there any issues related to time when providing MOOCs?	10	15.6	54	84.4
15	Is your institution experiencing any issues with the declaration of results for the MOOC course?	0	0.0	64	100
16	Has your institution issued credits and certificates to students who completed MOOC courses?	0	0.0	64	100
17	Do you find problems related to the availability of resources (e.g., laptops, smartphones, audio recorders, etc.)?	4	6.2	60	93.8
18	Do you encounter issues related to providing good internet facilities for offering MOOCs?	7	10.9	57	89.1
19	Has your institution encountered difficulties uploading materials such as videos, audio, and assignments for the MOOC course?	5	7.8	59	92.2
20	Do you encounter problems with the accessibility of course materials in MOOCs after completing classes?	0	0	64	100.0
21	Is the content coverage of the MOOC course in line with the guidelines of NEP 2020?	6	9.4	58	90.6
22	Is there a problem related to the medium of instruction of MOOCs?	3	4.7	61	95.3
23	Do you encounter issues with the evaluation procedure for students' overall performance on MOOCs?	11	17.2	53	82.8
24	Do you find it challenging to keep track of students' assignments and participation in MOOCs?	5	7.8	59	92.2

The data given above reflected the institutional challenges and perceptions regarding the implementation of MOOCs across the four central universities of North East India. Although the University Grants Commission has given clear cut direction to the universities to implement MOOCs, one of the major significant challenges reported is host institution. Majority (92.7%) of the respondents stated that their

institutions were not directly involved in hosting and delivery of MOOC courses and conducting examination.

One respondent stated:

“Although meetings and conferences had already been organized regarding the adoption and development of MOOCs, establishing the university as a host institute is still far from being achieved.”

Another respondent noted:

“To become a host institute, there are many things to undertake if you read the UGC SWAYAM regulations. Facilities like a studio, a camera to record, and a link to the online. Such necessary infrastructure was set up in a room at the cluster building. However, establishing the university as a host institute will take time and is not yet possible for now.”

When asked if there were any issues regarding the design, development, and implementation of MOOCs in the university, one respondent explained:

“Definitely. There are problems. First, time is one constraint for us. It’s a significant factor. Another challenge is the recording process. As teachers, it’s difficult for us to present in front of a camera. Teaching in a traditional classroom is different from teaching in a recorded format. Pre-recording everything can be challenging since standing in front of a camera is problematic for us. Furthermore, there are issues with coordination and arrangements. While we don’t face major challenges with assessments, time constraints play a role in determining when students are ready and in submitting their assignments. These are some of the constraints we have.”

MOOCs have not yet been integrated enough to create administrative strain in many cases, and consequently have not been implemented at scale. However, one of the challenges identified was the evaluation system. Respondents who had experience with MOOCs reported issues with evaluating student performance, as this was done by the National Testing Agency (NTA).

When asked, “How many students have successfully completed their courses and received certificates?”. One MOOC Co-Ordinator commented:

“I can't provide that information right now because we don't have the exact number of students who have passed. Since these are Massive Open Online Courses (MOOCs), many students from different universities are participating, which makes it difficult to track completion. The National Testing Agency (NTA) is the only entity that holds that information.”

When asked about the examination centre, one MOOC Co-Ordinator further commented:

“The NTA designates the examination centers. Students also have options for where to take their exams. For instance, when I took ARPIT courses on SWAYAM MOOCs, I filled out the form, and my exam center was assigned to a location in Imphal. I took the exam in a computer center approved by the NTA and passed.”

Another respondent stated:

“There is a concern about whether students are truly learning since everything is done online. One issue we face is ensuring that examinations are genuinely conducted and that integrity is maintained during the assessment process.”

From the above analysis, it was evident that the measures implemented so far regarding MOOCs in central universities of North East India left much to be desired. At the time of data collection for the study, i.e, six to seven years after the UGC has laid down the *Credit Framework for Online Learning Courses through SWAYAM Regulations (2016)*, it seemed to be a challenging initiative for the universities.

Although awareness of MOOCs was widely prevalent, widespread satisfactory integration is yet to be seen. The fundamental issue regarding MOOCs in these universities was this significant gap between knowing about MOOCs and its active practice or adoption. MOOCs have not yet been integrated enough to generate

issues that were worth studying in depth. Additionally, there was also a significant gap among the universities in terms of MOOCs implementation, ranging from initial stage meetings to full swing adoption offering variety of courses.

There was a general lack of supporting staff at the institution level as well as training initiatives for designing, developing and providing MOOCs courses, resulting in a significant lack of teacher participation in creating these courses. Moreover, the institutions were not equipped with necessary infrastructure to run MOOC course, this was reflected by the fact that majority of the institution not offering a regular MOOC course. Further, majority of the universities were also not host institutes and therefore were not directly involved in hosting and delivery of MOOC courses and conducting examination. This had led to problems in finding out issues relating to MOOCs implementation, as majority of the questions regarding implementation issues were met with negative responses due to lack of implementation, and the revealed issues were only from the few universities that actually implement MOOCs.

Students' enrolment in SWAYAM-MOOC was also not satisfactory, and there was a lack of proper feedback mechanism for MOOCs from the student, both of which might be due to lack of awareness about MOOCs on the students' part.

Further concern noted was time constraint. For universities with no supporting staff from affiliated colleges, it was difficult for teachers to make time for MOOCs efforts on top of their regular teaching workload. Moreover, the recording process for MOOCs courses was also a challenge, as teachers were not used to present in front of cameras for recorded courses without proper training and practice.

Moreover, evaluation system was carried out by the National Testing Agency (NTA), making it difficult to track how many students completed their courses and received certificates based on institution, as it was an online format and students from various institutions participated.

Concerns regarding academic integrity and accountability in terms of students learning and examination process were also expressed, and a push for enhanced funding to facilitate more MOOC courses was also noted.

4.4. Analysis and Interpretation of Objective 4

Objectives 4: *To assess university students' perception of learning through MOOCs.*

To comprehensively address the fourth objective of the study, which aims to evaluate students' perceptions of Massive Open Online Courses (MOOCs) in the central universities of North East India, a series of insightful questions was asked to the participants. To assess students' perceptions of MOOCs, the data were analyzed and computed separately for students with prior knowledge and experience with MOOCs and those without prior knowledge. Table 4.12 provides a detailed analysis of the responses and opinions regarding students having no prior knowledge of MOOCs. Subsequently, Table 4.13 summarizes data highlighting the experiences of students who have actively participated in MOOCs, specifically those enrolled in these online courses, offering insights into their firsthand experiences. This includes a variety of perceptions from respondents who were asked to select a word that best describes their view of MOOCs.

Table 4.12

Students' Thoughts on MOOCs

S/No.	Categories	Total	Percentages
1.	Interesting	152	21.3
2.	Scary	6	0.8
3.	Off-putting	4	0.6
4.	Confusing	40	5.6
5.	Helpful	152	21.3
6.	Encouraging	98	13.7
7.	Important	95	13.3
8.	Boring	16	2.2

S/No.	Categories	Total	Percentages
9.	Irrelevant	4	0.6
10.	Difficult	26	3.6
11.	Stimulating	17	2.4
12.	Challenging	60	8.4
13.	Thought-provoking	13	1.8
14.	Changed my view	29	4.0

Figure 4.2

Graphical Representation of Students' Perceptions on MOOCs

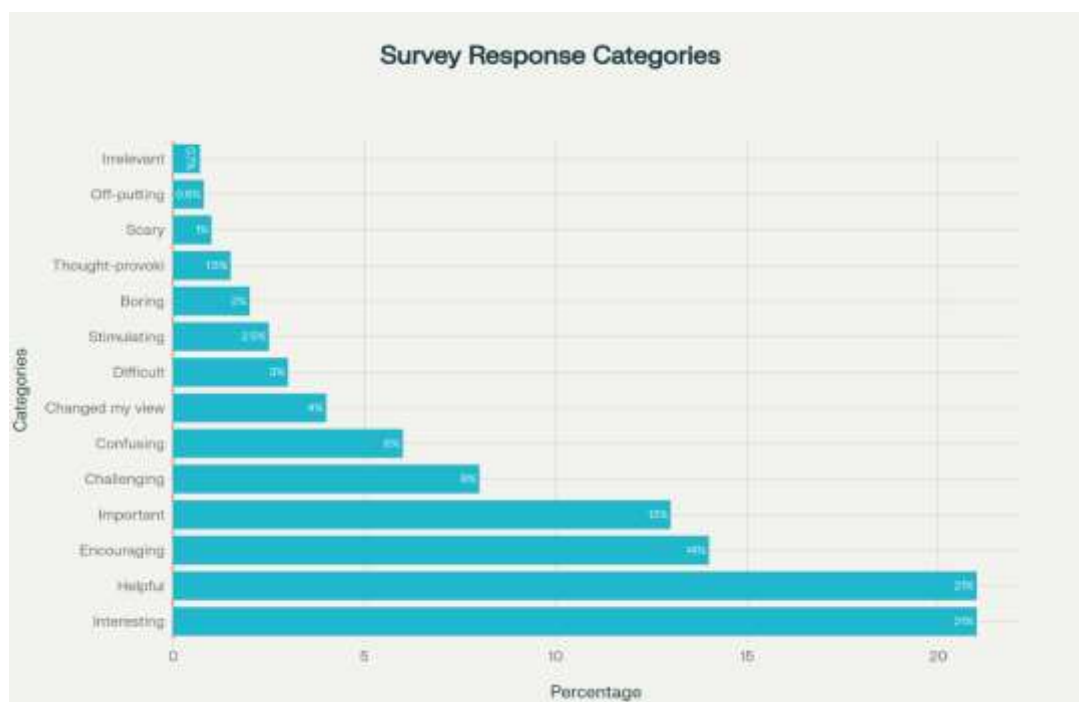


Table 4.12 and Figure 4.2 present the responses and opinions given by students who have no prior knowledge about Massive Open Online Courses (MOOCs). Students were asked to share their honest opinions about MOOCs and could select multiple words that best described their understanding of the topic. The study's data revealed that students, especially those new to MOOCs, expressed their definitions, giving insight into their initial thoughts about this modern form of

education. Most students, with 21.3% found MOOCs to be interesting and helpful, respectively. With 13.7% and 13.3%, students opined that MOOCs were encouraging and important, respectively, for further studies and knowledge acquisition. However, a small number of students found MOOCs to be challenging (8.4%) and confusing (5.6%). 4% of the respondents reported that MOOCs changed their view towards online learning, 3.6% found it difficult, and 2.4% believed that it is stimulating. Also, the remaining small fractions of the respondents opined that MOOCs were thought-provoking, irrelevant, off-putting, and scary.

Students with experience in MOOCs were analyzed separately to understand the difference between those with prior knowledge and those unfamiliar, with their insights detailed in Table 4.13.

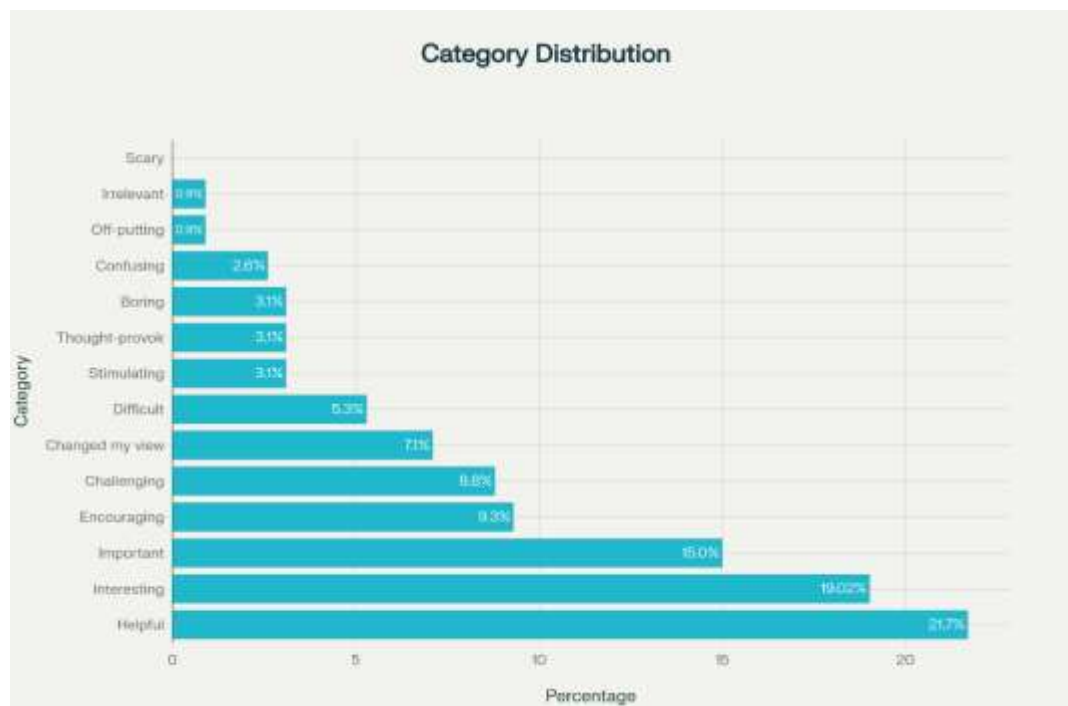
Table 4.13

Enrolled Students' Thoughts on MOOCs

S/No.	Category	Total	Percentages
1.	Interesting	43	19.02
2.	Scary	-	-
3.	Off-putting	2	0.9
4.	Confusing	6	2.6
5.	Helpful	49	21.7
6.	Encouraging	21	9.3
7.	Important	34	15.0
8.	Boring	7	3.1
9.	Irrelevant	2	0.9
10.	Difficult	12	5.3
11.	Stimulating	7	3.1
12.	Challenging	20	8.8
13.	Thought-provoking	7	3.1
14.	Changed my view	16	7.1

Figure 4.3

Perceptions of Enrolled Students towards MOOCs



According to Table 4.13, it was observed that as enrolled students gain knowledge and experience through MOOCs, 21.7% of them found MOOCs to be very helpful for complementing their studies. Additionally, 19% and 15% of the enrolled students perceived MOOCs as interesting and important, respectively. With 9.3% and 8.8%, enrolled students opined that MOOCs were both encouraging and challenging. 7.1% of the respondents reported that MOOCs changed their views toward online learning, 5.3% found it difficult, and the remaining small numbers opined that MOOCs were stimulating (3.1%), boring (3.1%), and thought-provoking (3.1%). 2.6% of the students found it confusing, while the remaining opined that MOOCs were irrelevant (0.9%) and off-putting (0.9%).

When comparing the students' opinions of MOOCs between students with and without prior knowledge, the data revealed that the majority of students without prior knowledge opined that MOOCs were both interesting and helpful, with 21.3%

of students in each category. However, those with prior knowledge, 21.7% opined that MOOCs were found genuinely helpful in complementing their studies.

Additionally, those with prior knowledge showed a slight decline in opinions compared to those without prior knowledge; 19% and 15% of those with prior knowledge, respectively, opined that MOOCs were interesting and important. On the contrary, those without prior knowledge thought that MOOCs were encouraging and important, respectively, at 13.7% and 13.3%.

However, a decline was observed when compared to those with prior knowledge, where students reported that MOOCs were both encouraging and challenging, with a decline of 9.3% and 8.8%. Furthermore, a small number of students found MOOCs to be confusing (5.6%), changed their views (4%), difficult (3.6%), and stimulating (2.4%). Additionally, the remaining small fractions of the respondents opined that MOOCs were thought-provoking, irrelevant, off-putting, and scary for those without prior knowledge. However, students with prior knowledge did not agree with every word given to the statement, where they reported that MOOCs changed their views (7.1%), difficult (5.3%), stimulating (3.1%), boring (3.1%), and thought-provoking (3.1%). Additionally, words like “confusing” (2.6%), “irrelevant” (0.9%), and “off-putting” (0.9%) were also reported and expressed by students with prior knowledge about MOOCs.

4.5. Analysis and Interpretation of Objective 5

Objective 5: *To compare university students' perceptions of learning through MOOCs with respect to gender and streams of study.*

To compare the perceptions of students from central universities of North East India towards learning through MOOCs, learning perception was categorized into five dimensions: motivation, perceived importance, perceived benefits, learning expectations, and perceived challenges associated with MOOCs. The analysis involved calculating the percentage of student responses for each questionnaire item, as well as the mean percentage of each dimension. To examine whether students' perceptions differed significantly by gender and streams of study, null hypotheses were formulated for each dimension. Differences were statistically assessed using the chi-square test, and the findings are presented in the tables.

Furthermore, objective no. 5 is subdivided into two specific sub-objectives to comprehensively describe the various dimensions of university students' perceptions regarding MOOCs with respect to gender and streams of study.

Sub-Objective 5 (a): *To compare university students' perceptions of learning through MOOCs with respect to gender.*

H_{01} : *There is no significant difference in the perception of learning motivation on MOOCs between male and female students in the central universities of North East India.*

Table 4.14

Students' perception of motivation for learning on MOOCs with respect to gender differences

Gender	Learning Motivation on MOOCs			
	Agree	Disagree	Undecided	Total
Male	74	14	12	100
Female	69	14	16	99
Total	143	28	28	199

Table 4.15

Computation of the chi-square value on students' perception of motivation for learning on MOOCs with respect to gender differences

χ^2	df	Level of significance
0.74	2	0.05 = 5.991

Table 4.14 illustrates the students' perceptions of motivation for learning on MOOCs with respect to gender differences. It displays the mean percentages of male and female students regarding their perceived learning motivation on MOOCs.

From Table 4.15, it is clear that the computed chi-square value of 0.74 is much less than the critical chi-square value of 5.991, with degrees of freedom = 2 at 0.05 level of significance. Hence, it is said to be non-significant. Consequently, the null hypothesis, which states, '*there is no significant difference in the perception of learning motivation on MOOCs between male and female students in the central universities of North East India,*' cannot be rejected as there is no significant difference between the perception of male and female students in their motivation to learn on MOOCs. Hence, the null hypothesis (H_{01}) was accepted.

Qualitative insights: *Focus group discussions further corroborate the statistical findings. Both male and female students reported these courses helped boost confidence and self-esteem, contributed to personal development, allowed learning at their own pace, and complemented formal studies. No meaningful differences were observed in the motivational factors cited by male and female students, confirming that gender does not significantly influence motivation to learn through MOOCs in this sample.*

H₀₂: There is no significant difference in the perception of the importance of learning through MOOCs between male and female students in the central universities of North East India.

Table 4.16

Students' Perception of the Importance of Learning through MOOCs With Respect to Gender Differences

Gender	Importance of learning on MOOCs			
	Agree	Disagree	Undecided	Total
Male	78	9	13	100
Female	73	5	21	99
Total	151	14	34	199

Table 4.17

Computation of the Chi-Square Value on Students' Perception of the Importance of Learning through MOOCs With Respect to Gender Differences

χ^2	df	Level of significance
3.19	2	0.05 = 5.991

Table 4.16 and Table 4.17 illustrate the mean percentages of students' perceptions of the importance of learning through MOOCs as well as the computation of the chi-square value, respectively. Table 4.15 presents the mean percentages of the perceived importance placed on learning through MOOCs by male and female students.

From Table 4.17, it is clear that the computed chi-square value of 3.19 is less than the critical value of 5.991 with $df = 2$ at a 0.05 significance level. Hence, it is said to be non-significant. Therefore, the null hypothesis stating '*there is no significant difference in the perception of the importance of learning through MOOCs between male and female students in the central universities of North East India*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived importance of learning through MOOCs by male and female students. Hence, the null hypothesis (H_{02}) was accepted.

Qualitative insights: The focus group discussion further revealed that both male and female students mentioned that the MOOC course improved their study skills. One female student further commented that learning through MOOCs enhanced self-study and boosted self-discipline, requiring them to be always alert to the weekly lesson updates, and also helped them stay on track. One male student also mentioned that the platform being easy to use and the courses enhanced the classroom learning. Consequently, the perceptions shared by both male and female students towards the importance of learning through MOOCs showed that there is no significant difference in the perceived importance of learning through MOOCs based on gender.

H₀₃: *There is no significant difference in the perception of the benefits of learning through MOOCs between male and female students in the central universities of North East India.*

Table 4.18

Students' Perception of the Benefits of Learning through MOOCs With Respect to Gender Differences

Gender	Benefits of learning through MOOCs			
	Agree	Disagree	Undecided	Total
Male	64	11	25	100
Female	69	7	24	100
Total	133	18	49	200

Table 4.19

Computation of the chi-square value on students' perception of the benefits of learning through MOOCs with respect to gender differences

χ^2	df	Level of significance
1.10	2	0.05 = 5.991

Table 4.18 displays the mean percentages of students' perceived benefits of learning through MOOCs concerning gender. The computed chi-square value of male and female students' perceptions on the benefits of learning through MOOCs is presented in Table 4.19.

The computed chi-square value of 1.10 is much less than the critical chi-square value of 5.991 with $df = 2$ at a 0.05 significance level. Thus, it is said to be non-significant, and therefore, the null hypothesis, which states '*there is no significant difference in the perception of the benefits of learning through MOOCs between male and female students in the central universities of North East India,*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived benefits of learning through MOOCs between male and female students. Hence, the null hypothesis (H_{03}) was accepted.

Qualitative Insights: From the focus group discussions, it was found that students were able to learn at their own pace and had access to learning materials at any time. One female student mentioned that she had the opportunity to learn higher education-level content at a low cost and that she got the chance to have additional certificates through the MOOC courses. One male student further commented that he had the opportunity to learn high-quality content through video lectures and that transcript were provided for the videos and slides, allowing him to learn from his comfort zone, which benefited him. Consequently, there is no significant difference in the perceived benefits of learning through MOOCs concerning gender.

H_{04} : *There is no significant difference in the perception of learning expectations of MOOCs between male and female students in the central universities of North East India.*

Table 4.20

Students' perception of learning expectations of MOOCs with respect to gender differences

Gender	Learning expectations on MOOCs			Total
	Agree	Disagree	Undecided	
Male	77	8	16	101
Female	83	3	14	100
Total	160	11	30	201

Table 4.21

Computation of the chi-square value on students' perception of learning expectations of MOOCs with respect to gender differences

χ^2	df	Level of significance
2.63	2	0.05 = 5.991

Table 4.20 and Table 4.21 present the students' perceptions of learning expectations of MOOCs based on gender as well as the computation of the chi-square value for the mean percentages of the perceived learning expectations of MOOCs between male and female students, respectively.

From Table 4.20, it is clear that the computed chi-square value of 2.63 is less than the critical chi-square value of 5.991 with $df = 2$ at a 0.05 significance level. Hence, it is non-significant. Consequently, the null hypothesis, which states '*there is no significant difference in the perception of learning expectations of MOOCs between male and female students in the central universities of North East India,*' cannot be rejected. Therefore, it can be concluded that there is no significant difference in the perceived learning expectations of MOOCs between male and female students. Hence, the null hypothesis (H_{04}) was accepted.

Qualitative Insights: *The students further commented with regard to their perceived learning expectations through the MOOC courses. One female student stated that the MOOC courses will definitely enhance her knowledge for the modern competitive job market. Another female student added that the MOOC courses will be helpful in preparing them for their further studies. This MOOC course will be helpful for youth to stay updated on changes in technology-enhanced learning and innovative pedagogies, as noted by one male student in addition to the comments provided by others. Furthermore, another male student opined that the MOOC courses would be helpful for working students and would also supplement their existing studies. Consequently, from the focus group discussions, it is clear that both male and female students had positive expectations from learning through MOOCs. Hence, there is no significant difference in the perceived learning expectations on MOOCs with respect to gender.*

H₀₅: There is no significant difference in the perception of the learning challenges through MOOCs between male and female students in the central universities of North East India.

Table 4.22

Students' perception of the learning challenges through MOOCs with respect to gender differences

Gender	Learning challenges on MOOCs			
	Agree	Disagree	Undecided	Total
Male	53	23	24	100
Female	43	22	35	100
Total	96	45	59	200

Table 4.23

Computation of the chi-square value on students' perception of the learning challenges through MOOCs with respect to gender differences

χ^2	df	Level of significance
3.11	2	0.05 = 5.991

Table 4.22 presents the mean percentages of students' perceptions of the learning challenges through MOOCs based on gender. Table 4.23 displays the computed chi-square value on the learning challenges through MOOCs as perceived by male and female students.

The computed chi-square value of 3.11, presented in Table 4.23, is less than the critical chi-square value of 5.991 with $df = 2$ at a 0.05 significance level. Hence, it is said to be non-significant. Therefore, the null hypothesis, which states '*there is no significant difference in the perception of the learning challenges through MOOCs between male and female students in the central universities of North East India,*' cannot be rejected. Consequently, there is no significant difference in the perceived learning challenges through MOOCs between male and female students. Hence, the null hypothesis (H_{05}) was accepted.

Qualitative Insights: Concerning the perceived challenges of learning through MOOCs, both male and female students at the central universities of North East India noted that unreliable internet connectivity posed an issue for those residing in remote areas or who have limited internet access. Additionally, both students further commented that weekly assignments can be missed if updates are not checked regularly, which in turn will affect the overall assessment marks. Therefore, from the focus group discussions, it was found that there is no significant difference in the perceived learning challenges through MOOCs concerning gender.

Sub-Objective 5 (b): To compare university students' perceptions of learning through MOOCs with respect to streams of study.

H_{06} : *There is no significant difference in the perception of learning motivation through MOOCs between arts and sciences streams of the central universities of North East India.*

Table 4.24

Students' perception of motivation for learning on MOOCs with respect to differences in stream of study

Streams of study	Learning Motivation on MOOCs			
	Agree	Disagree	Undecided	Total
Arts	74	10	15	99
Sciences	70	15	15	100
Total	144	25	30	199

Table 4.25

Computation of the chi-square value on students' perception of the motivation for learning through MOOCs with respect to differences in stream of study

χ^2	df	Level of significance
1.11	2	0.05 = 5.991

Table 4.24 illustrates the students' motivation to learn on MOOCs in relation to the streams of study. It displays the mean percentages of arts and sciences students regarding their perceived learning motivation on MOOCs.

From Table 4.25, it is clear that the computed chi-square value of 1.11 is much less than the critical chi-square value of 5.991, with degrees of freedom = 2 at a 0.05 significance level. Hence, it is non-significant. Consequently, the null hypothesis, which states, '*there is no significant difference in the perception of learning motivation on MOOCs between arts and sciences streams of the central universities of North East India,*' cannot be rejected as there is no significant difference between the perception of arts and sciences students in their motivation to learn on MOOCs. Consequently, the null hypothesis (H_{06}) was accepted.

Qualitative Insights: *The qualitative data from the focus group discussions support these findings where both students from arts and sciences stream had a similar motivational factor such as teacher encouragement, self-paced learning and personal development, indicating that stream of study does not influence the motivation factor for MOOCs in this context.*

H_{07} : *There is no significant difference in the perception of the importance of learning through MOOCs between arts and sciences streams of the central universities of North East India.*

Table 4.26

Students' perception of the importance of learning through MOOCs with respect to differences in stream of study

Streams of study	Importance of learning on MOOCs			
	Agree	Disagree	Undecided	Total
Arts	73	8	19	100
Sciences	77	6	17	100
Total	150	14	36	200

Table 4.27

Computation of the chi-square value on students' perception of the importance of learning through MOOCs with respect to differences in stream of study

χ^2	df	Level of significance
0.50	2	0.05 = 5.991

Table 4.26 and Table 4.27 illustrate the mean percentages of students' perceptions of the importance of learning through MOOCs and the computation of the chi-square value, respectively. Table 4.26 presents the mean percentages of the perceived importance placed on learning through MOOCs by students from arts and sciences streams.

From Table 4.27, it is clear that the computed chi-square value of 0.50 is much less than the critical value of 5.991 with $df = 2$ at a 0.05 significance level. Hence, it is said to be non-significant. Therefore, the null hypothesis stating '*there is no significant difference in the perception of the importance of learning through MOOCs between arts and sciences streams of the central universities of North East India*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived importance of learning through MOOCs by students from the arts and sciences streams. Hence, the null hypothesis (H_{07}) was accepted.

Qualitative Insights: *The findings from the focus group insights further revealed that both the arts and sciences students appreciate MOOCs for improving study skills and complementing classroom learning, reinforcing the statistical conclusion of no significant differences with respect to streams of study in perceived importance of learning through MOOCs.*

H₀₈: There is no significant difference in the perception of the benefits of learning through MOOCs between arts and sciences streams of the central universities of North East India.

Table 4.28

Students' perception of the benefits of learning through MOOCs with respect to differences in stream of study

Streams of study	Benefits of learning through MOOCs			
	Agree	Disagree	Undecided	Total
Arts	66	9	25	100
Sciences	68	11	22	101
Total	134	20	47	201

Table 4.29

Computation of the chi-square value on students' perception of the benefits of learning through MOOCs with respect to differences in stream of study

χ^2	df	Level of significance
0.42	2	0.05 = 5.991

Table 4.28 displays the mean percentages of students' perceived benefits of learning through MOOCs concerning the stream of arts and sciences. The computed chi-square value for students' perception of the benefits of learning through MOOCs, comparing students of arts and sciences, is presented in Table 4.29.

The computed chi-square value of 0.42 is much less than the critical chi-square value of 5.991 with $df=2$ at a 0.05 significance level. Thus, it is said to be non-significant. Therefore, the null hypothesis, which states that '*there is no significant difference in the perception of the benefits of learning through MOOCs between arts and sciences streams of the central universities of North East India,*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences students. Hence, the null hypothesis (H_{08}) was accepted.

Qualitative Insights: The focus group insights highlighted the perceived benefits of learning through MOOCs such as flexible pacing, affordable access to higher education content, and availability of certificates, equally recognized by both the arts and sciences students. These qualitative insights confirm that there are no significant differences with respect to stream of study in the perceived benefits of learning through MOOCs.

H_{09} : *There is no significant difference in the perception of the learning expectations of MOOCs between arts and sciences streams of the central universities of North East India*

Table 4.30

Students' perception of learning expectations of MOOCs with respect to differences in stream of study

Streams of study	Learning expectations on MOOCs			Total
	Agree	Disagree	Undecided	
Arts	84	5	11	100
Sciences	77	6	17	100
Total	161	11	28	200

Table 4.31

Computation of the chi-square value on students' perception of learning expectations of MOOCs with respect to differences in stream of study

χ^2	df	Level of significance
1.68	2	0.05 = 5.991

Tables 4.30 and 4.31 present the students' perceptions of learning expectations on MOOCs based on the streams of study and the computation of the chi-square value on the mean percentages of the perceived learning expectations of MOOCs between arts and sciences students, respectively.

Table 4.31 shows that the computed chi-square value of 1.68 is less than the critical chi-square value of 5.991 with $df = 2$ at a 0.05 significance level. Hence, it is

non-significant. Consequently, the null hypothesis, which states '*there is no significant difference in the perception of learning expectations of MOOCs between arts and sciences streams,*' cannot be rejected. Therefore, it can be concluded that there is no significant difference in the perceived learning expectations of MOOCs between students from the arts and sciences streams. Hence, the null hypothesis (H_{09}) was accepted.

Qualitative Insights: *The focus group insights indicated positive expectations from MOOCs among both stream of study, indicating job market relevance, preparation for further studies, technology updates, and support for working students, demonstrating a shred outlook. Thus, the insights given by students from the arts and sciences stream of study confirm that there is no significant difference in the perceived expectations of learning through MOOCs.*

H_{010} : *There is no significant difference in the perception of the learning challenges through MOOCs between arts and sciences streams of the central universities of North East India*

Table 4.32

Students' perception of the learning challenges through MOOCs with respect to differences in stream of study

Streams of study	Learning challenges on MOOCs			
	Agree	Disagree	Undecided	Total
Arts	50	17	33	100
Sciences	48	27	25	100
Total	98	44	58	200

Table 4.33

Computation of the chi-square value on students' perception of the learning challenges through MOOCs with respect to differences in stream of study

χ^2	df	Level of significance
3.42	2	0.05 = 5.991

Table 4.32 presents the mean percentages of students' perceptions of MOOCs' learning challenges between the streams of arts and sciences. Table 4.33 displays the computed chi-square value on MOOCs' learning challenges as perceived by arts and sciences students.

The computed chi-square value of 3.42, presented in Table 4.33, is less than the critical chi-square value of 5.991 with $df = 2$ at a 0.05 significance level. Hence, it is said to be non-significant. Therefore, the null hypothesis, which states '*there is no significant difference in the perception of the learning challenges through MOOCs between the streams of arts and sciences,*' cannot be rejected. Consequently, there is no significant difference in the perceived learning challenges through MOOCs between the students from the arts and sciences stream. Hence, the null hypothesis (H_{010}) is accepted.

Qualitative Insights: *The qualitative data from the focus group discussion revealed that students from both the stream of study identified similar challenges such as unreliable internet connections in remote areas and difficulties managing weekly assignments, confirming no significant differences with respect to stream of study in the perceived challenges of learning through MOOCs.*

The study's findings revealed that none of the five dimensions-perceived motivation, perceived importance, perceived benefits, perceived expectations and perceived challenges of learning through MOOC, showed statistically significant differences based on gender and stream of study among students in the central universities of North East India. These quantitative results were further corroborated by qualitative insights from focus group discussions, which affirmed the consistency of perceptions across these demographic variables.

The quantitative data presented below reflects the overall distribution of male and female students' perceptions across five key dimensions of learning through MOOCs - motivation, importance, benefits, expectations, and challenges, along with the corresponding chi-square (χ^2) values.

Table 4.34*Mean percentages of the dimensions of learning on MOOCs*

Dimensions	Mean percentages of the dimensions of learning on MOOCs concerning gender						Chi-Square (χ^2) value
	Male			Female			
	A	D	U	A	D	U	
Motivation	74	14	12	69	14	16	0.74
Importance	78	9	13	73	5	21	3.19
Benefits	64	11	25	69	7	24	1.10
Expectations	77	8	16	83	3	14	2.63
Challenges	53	23	24	43	22	35	3.11

For all five dimensions, the chi-square values are substantially below the critical value threshold, indicating that there is no statistically significant difference between male and female students in their perceptions regarding learning through MOOCs. The "agree" percentages are generally high for both genders in positive dimensions (motivation, importance, benefits, expectations), while a lower percentage agreed when asked about challenges, further demonstrating alignment in their attitudes.

Qualitative Insights: Qualitative findings from focus group discussions reinforce these quantitative results. Both male and female students reported comparable sources of motivation, frequently citing the encouragement received from teachers, the flexibility and self-paced nature of MOOCs, and personal growth opportunities afforded by such courses. Students of both genders highlighted the importance of MOOCs in enhancing study skills, building self-discipline, and supporting formal education.

When discussing benefits, participants mentioned access to course materials at any time, the opportunity to obtain certifications, and exposure to high-quality instructional content. Both groups expressed similar expectations, such as improved job market preparedness and readiness for advanced studies.

Challenges noted by both male and female students included difficulties such as unreliable internet connectivity and the need for consistent engagement with course assignments to avoid missing deadlines. These shared experiences suggest a common set of barriers faced regardless of gender

The alignment of quantitative and qualitative findings affirms the absence of significant gender-based differences in the perception of MOOCs across all five dimensions, emphasizing the consistency and robustness of student perspectives among central universities in North East India.

Table 4.35 summarizes the distribution of students' perceptions across five key dimensions of learning through MOOCs by streams of study (Arts and Sciences), including their respective chi-square (χ^2) values.

Table 4.35

Mean percentages of the dimensions of learning on MOOCs

Dimensions	Mean percentages of the dimensions of learning on MOOCs concerning the streams of study						Chi-Square (χ^2) value
	Arts			Sciences			
	A	D	U	A	D	U	
Motivation	74	10	15	70	15	15	1.11
Importance	73	8	19	77	6	17	0.50
Benefits	66	9	25	68	11	22	0.42
Expectations	84	5	11	77	6	17	1.68
Challenges	50	17	33	48	27	25	3.42

Across all five dimensions - motivation, importance, benefits, expectations, and challenges, the chi-square values are well below the critical threshold, demonstrating that there is no statistically significant difference in perceptions between students from arts and sciences streams regarding MOOCs. The "agree" percentages are similar for both streams in positive dimensions such as motivation and importance; for challenges, the distribution illustrates that concerns are comparable across streams as well.

Qualitative Insights: Qualitative findings from focus group discussions validate these quantitative results. Students from both arts and sciences backgrounds cited motivation factors like self-improvement, career growth, teacher encouragement, and the flexibility MOOCs offer for personalized learning. Both groups recognized the significance of MOOCs in supplementing formal education, aiding self-directed study, and preparing for future opportunities.

Benefits discussed included the accessibility of learning materials, opportunities to gain additional qualifications, and exposure to content not always available in their regular curriculum. Students across both streams shared comparable expectations, such as improved preparedness for advanced studies and better alignment with job market requirements. In terms of challenges, participants from both groups highlighted issues such as internet connectivity, keeping pace with course updates, and balancing assignments with other commitments. The shared nature of these difficulties underscores common experiences and barriers, regardless of discipline.

The alignment between quantitative and qualitative findings suggests a high degree of consistency in MOOC-related perceptions between arts and sciences students in central universities of North East India, reinforcing the absence of statistically significant differences across all examined dimensions.

4.6. Analysis and Interpretation of Objective 6

Objective 6: *To assess the perception of university teachers of central universities of North East India on MOOCs' pedagogy and learning design.*

To achieve objective no 6, “To assess the perception of university teachers of central universities of North East India on MOOCs' pedagogy and learning design,” the data were analyzed by calculating the percentages of teachers' responses for each item, which are presented in the following tables.

Table 4.36

Perceptions of Teacher Respondents towards MOOCs

Perception	Frequency	Percentages
Interesting	77	16.3
Scary	-	-
Off-putting	-	-
Confusing	19	4
Helpful	75	15.9
Encouraging	49	10.4
Important	64	13.6
Boring	-	-
Irrelevant	-	-
Difficult	51	10.8
Stimulating	-	-
Challenging	86	18.3
Thought-provoking	7	1.5
Changed my view	43	9.1
Total	471	100

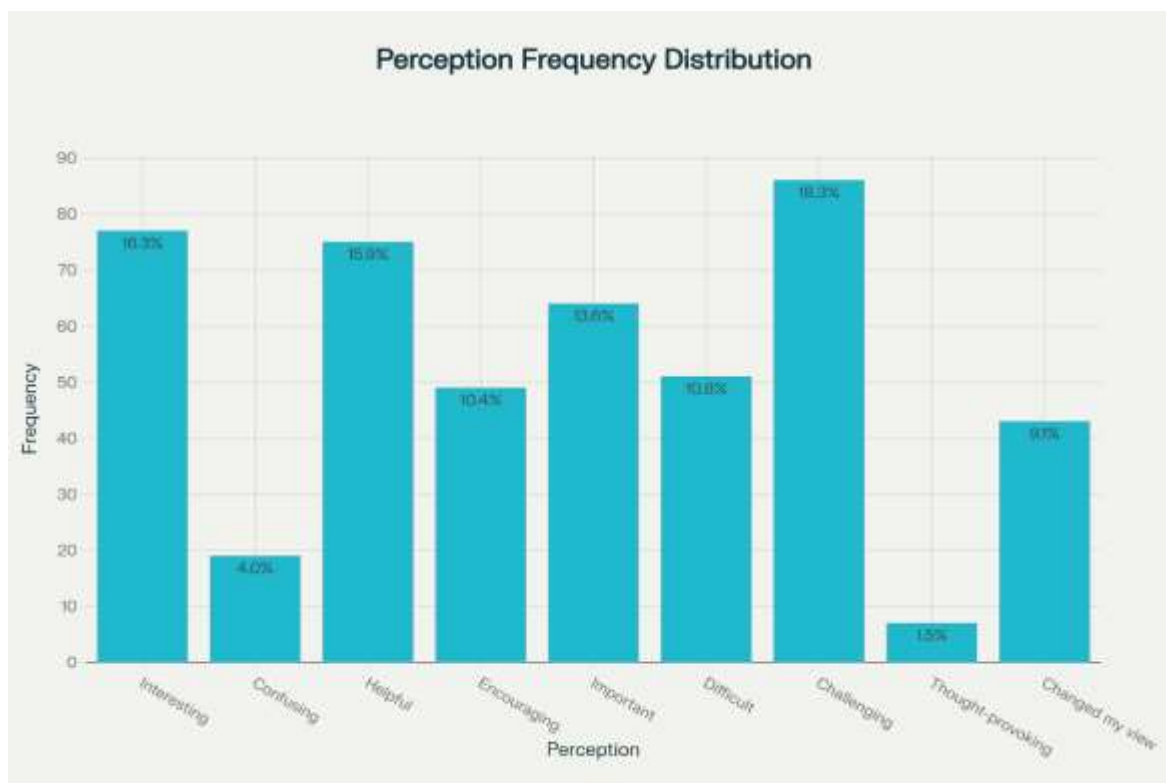
Figure 4.4*Perceptions of Teachers towards MOOCs*

Table 4.36 presents teachers' views on Massive Open Online Courses (MOOCs). The teachers were asked to share their honest opinions about MOOCs and could select multiple words that best described their understanding of the topic. The study's data revealed that teachers, both those new to MOOCs and those with prior knowledge and experience, expressed their definitions, giving insight into their initial thoughts about this modern form of education. With 18.3%, teachers perceived MOOCs to be challenging. 16.3% and 15.9% of teachers opined that MOOCs are interesting and helpful for knowledge enhancement. Additionally, 13.6% of the total teacher respondents perceived MOOCs as important for further upskilling and boosting their confidence in online learning courses. With 10.8%, 10.4% and 9.1% respectively, the teacher respondents opined that MOOCs seem to be both difficult and encouraging for knowledge development, and these online learning courses changed their view with regard to the digital learning innovation. On the contrary,

only a few of the teachers opined that MOOCs were confusing and thought-provoking.

Through the interview scheduled and discussion conducted by the researcher, the teacher's respondents further commented on their perception of MOOCs. MOOCs were perceived as challenging as they increased the workload and activities of teachers beyond the regular classroom teaching-learning process, as stated by one respondent. Some teachers have opined that MOOCs are interesting due to their innovations to promote digital learning and technology integration across all levels of education, as per the NEP 2020. One respondent further commented that MOOCs will be helpful in the near future in enhancing teaching, enabling personalized learning, and ensuring equitable access to quality education even for the most disadvantaged, which meets the needs globally and locally. Additionally, another respondent further elaborated that MOOCs are an important online course for boosting confidence, promoting self-esteem, and acquiring knowledge and skills that enhance their teaching process.

On the contrary, some respondents opined that MOOCs were difficult because they required skills, digital literacy, and knowledge to properly operate technological facilities such as cameras, recorders, and uploading materials online, among other things, for the smooth delivery and offering of MOOCs. Consequently, to acquire digital literacy and technological knowledge, teachers were expected and required to train in such areas, which increases the workload and activities of the teachers. At the same time, some teachers opined that MOOCs are encouraging as they provide an opportunity to enhance their knowledge of trending digital literacy and technological knowledge, and keep them updated concerning the integration and incorporation of technologies in the modern educational system.

4.7. Analysis and Interpretation of Objective 7

Objective 7: *To compare university teachers' perceptions of MOOCs' pedagogy and learning design with respect to gender, streams of study, and teaching experiences.*

The study seeks to examine the varied perceptions of university teachers regarding the pedagogy and learning design of Massive Open Online Courses (MOOCs). To ensure a comprehensive analysis, the respondents were carefully categorized based on several variables: gender (male and female), streams of study (arts and sciences streams), and teaching experiences (above ten years and below ten years). The structured questionnaire developed for this purpose was systematically designed to capture teachers' perception across two broad dimensions: pedagogy and learning design. The pedagogy dimension focuses on critical areas such as the motivation for learning, the perceived benefits of learning through MOOCs, and the perceived learning challenges encountered during the learning process in this digital landscape. Additionally, the learning design aspect was systematically divided into two categories: teachers' perceptions of learning design and teachers' perceptions of the development and implementation of learning in MOOCs.

Data were collected from teacher respondents across central universities in North East India. Responses were carefully recorded, scored, and tabulated for detailed examination. To summarize the findings, mean percentages of each dimension were calculated, allowing for a clear understanding of the perceptions held by the respondents. Furthermore, chi-square test was employed to rigorously test the null hypotheses, thereby offering statistical evidence regarding potential differences in perceptions across gender, streams of study, and teaching experience.

This objective is subdivided into six specific sub-objectives to comprehensively describe the various aspects of university teachers' perceptions regarding MOOCs. The results based on these analyses are presented in the following tables:

Sub-Objective 7 (a): To compare university teachers' perceptions of MOOCs pedagogy with respect to gender.

H₀₁₁: There is no significant difference in the perception of motivation for learning in MOOCs between male and female teachers in central universities of North East India.

Table 4.37

Teachers' perception of motivation for learning in MOOCs with respect to gender differences

Gender	Learning motivation on MOOCs			
	Agree	Disagree	Undecided	Total
Male	96	4	0	100
Female	100	0	0	100
Total	196	4	0	200

Table 4.37 highlights teachers' perceptions of motivation for learning through MOOCs according to gender. Both male and female teachers reported overwhelmingly positive views, with only a small proportion of male teachers disagreeing, and no respondents from either group expressing indecision.

Table 4.38

Chi-square computation on teachers' perception of motivation for learning in MOOCs with respect to gender differences

χ^2	df	Level of significance
4.08	2	0.05 = 5.991

As shown in Table 4.38, the computed chi-square value 4.08 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. This indicates that the result is statistically non-significant. Therefore, the null hypothesis (H_{011}), which states that “*there is no significant difference in the perception of motivation for learning in MOOCs between male and female teachers in central universities of North East India,*” was accepted.

Qualitative Insights: The qualitative data from teacher interviews corroborate these quantitative findings. Both male and female teachers reported similar motivational factors for engaging in MOOCs. Their primary motivations included enhancing subject knowledge, supporting professional growth, and facilitating future career development.

H₀₁₂: There is no significant difference in the perceived benefits of learning through MOOCs between male and female teachers in central universities of North East India.

Table 4.39

Teachers perceived benefits of learning through MOOCs with respect to gender differences

Gender	Benefits of learning through MOOCs			
	Agree	Disagree	Undecided	Total
Male	79	9	11	99
Female	96	0	4	100
Total	175	9	15	199

Table 4.39 presents the distribution of male and female teachers' responses regarding the benefits of MOOCs. Both male and female teachers reported positive views, but the proportion of agreement was notably higher among female teachers, while male teachers expressed relatively greater levels of disagreement and indecision.

Table 4.40

Chi-square computation on teachers perceived benefits of learning through MOOCs with respect to gender differences

χ^2	df	Level of significance
13.91	2	0.05 = 5.991

Table 4.40 presents the computation of chi-square statistics. The calculated chi-square value was 13.91, which is greater than the critical value of 5.991 with df =

2 at 0.05 level of significance. Therefore, the difference in the perception of male and female teachers regarding the benefits of learning through MOOCs is statistically significant. Consequently, the null hypothesis (H_{012}) stating that “*there is no significant difference in the perceived benefits of learning through MOOCs between male and female teachers in central universities of North East India*” was rejected. It was concluded that female teachers perceived significantly greater benefits of MOOCs compared to their male counterparts.

Qualitative Insights: *The qualitative findings from information schedule supported the quantitative results. Female teachers highlighted MOOCs’ role in helping them adapt to technological changes and adopt innovative pedagogies. They valued MOOCs’ global reach for showcasing teaching quality and were especially appreciated for their flexibility, supporting working professionals’ continuous learning and development. Additionally, teachers reported that MOOCs enhanced their professional pride, provided access to international peers, and enriched their teaching skills. They also fostered collaboration and promoted self-directed, autonomous learning. Overall, the qualitative evidence underscored female teachers’ greater appreciation of MOOCs’ benefits compared to male teachers.*

H_{013} : *There is no significant difference in the perceived learning challenges through MOOCs between male and female teachers in central universities of North East India.*

Table 4.41

Teachers’ perception of the learning challenges through MOOCs with respect to gender differences

Gender	Learning challenges on MOOCs			
	Agree	Disagree	Undecided	Total
Male	59	31	11	101
Female	45	25	30	100
Total	104	56	41	201

Table 4.41 presents the distribution of teachers' perceptions regarding the learning challenges encountered in the use of MOOCs based on gender.

Table 4.42

Chi-square computation of teachers' perception of learning challenges through MOOCs with respect to gender differences

χ^2	df	Level of significance
11.33	2	0.05 = 5.991

Table 4.42 illustrates the results of the chi-square test applied to assess whether the observed variations in perceptions between male and female teachers are statistically significant.

The computed chi-square value of 11.33 is greater than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. This outcome indicates a statistically significant difference in perceptions of learning challenges between male and female teachers. As a result, the null hypothesis (H_{013}) that "*there is no significant difference in teachers' perception of MOOCs' learning challenges with respect to gender*" was rejected. It can therefore be concluded that gender plays a role in shaping teachers' perceptions of the challenges posed by MOOCs in the central universities of North East India. The findings suggest that both male and female teachers identify challenges in MOOCs, though a noticeable difference emerges in the degree of certainty. Male teachers display stronger agreement with the existence of learning challenges, while female teachers show a higher degree of indecisiveness toward the issue.

Qualitative Insights: *The qualitative insights indicated that male teachers emphasized technical and structural barriers, such as poor internet connectivity and inadequate university infrastructure, which they perceive as major impediments to effective MOOC delivery. In contrast, female teachers, among whom a larger proportion remained undecided, tended to focus more on pedagogical and accessibility issues, such as limited tutor interaction, language barriers, and challenges faced by learners with disabilities. This pattern suggests that female teachers may perceive these challenges with more complexity or uncertainty,*

possibly due to varying experiences or expectations regarding learner support. Both genders acknowledged the limited recognition of MOOCs as credit-earning courses, but the expressed depth and focus of challenge perceptions differed, affirming the statistically significant difference identified in the quantitative data.

Sub-Objective 7 (b): To compare university teachers' perceptions of MOOCs pedagogy with respect to streams of study.

H₀₁₄: There is no significant difference in the perception of motivation for learning in MOOCs between arts and sciences teachers in central universities of North East India.

Table 4.43

Teachers' perception of motivation for learning in MOOCs with respect to differences in the stream of study

Streams of study	Learning motivation on MOOCs			
	Agree	Disagree	Undecided	Total
Arts	96	4	0	100
Sciences	100	0	0	100
Total	196	4	0	200

Table 4.43 presents the distribution of teachers' responses on their motivation for learning in MOOCs across the arts and science streams.

Table 4.44

Computation of chi-square value on teachers' perception of motivation for learning on MOOCs based on the streams of study

χ^2	df	Level of significance
4.08	2	0.05 = 5.991

According to Table 4.44, the computed chi-square value 4.08 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. Therefore, the result is statistically non-significant. The null hypothesis (H_{014}), which states that “*there is no significant difference in the perception of motivation for learning in MOOCs between*

teachers across the arts and sciences streams in central universities of North East India,” was accepted. This finding indicated that arts and science teachers exhibit similar levels of motivation for learning through MOOCs.

Qualitative Insights: The qualitative insights obtained from interviews further corroborated this finding. Teachers across both streams consistently expressed that their primary motivation for enrolling in MOOCs was to broaden their knowledge base and enhance their professional development prospects. No meaningful differences in motivational factors emerged between arts and science faculty members.

H_{015} : *There is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences teachers in central universities of North East India.*

Table 4.45

Perceived benefits of learning through MOOCs by teachers with respect to differences in the streams of study

Streams of study	Benefits of learning through MOOCs			
	Agree	Disagree	Undecided	Total
Arts	86	4	10	100
Sciences	81	10	9	100
Total	167	14	19	200

Table 4.45 presents the distribution of teachers’ perceived benefits of learning through MOOCs across the arts and science streams.

Table 4.46

Computation of chi-square value on perceived benefits of learning through MOOCs by teachers based on the streams of study

χ^2	df	Level of significance
2.77	2	0.05 = 5.991

From Table 4.46, the computed chi-square value was found to be 2.77, which is less than the critical table value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is considered statistically non-significant. Consequently, the null hypothesis (H_{015}) which states that “*there is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences teachers in central universities of North East India,*” cannot be rejected. This result of the study showed that no significant difference exists in the perceived benefits of learning through MOOCs between arts and sciences teachers. Furthermore, the findings indicated that a majority of teachers from both streams agreed on the benefits of MOOCs for teaching and learning. Hence, the null hypothesis (H_{015}) was accepted.

Qualitative Insights: Supporting evidence from qualitative data reinforces this finding. Teachers from both streams consistently emphasized that MOOCs provide important supplementary knowledge and exposure, thereby enhancing students’ learning opportunities. The convergence of opinions among arts and science teachers suggests that MOOCs are widely recognized as beneficial irrespective of disciplinary background, which explains the absence of a significant difference in perception between the two groups.

H_{016} : *There is no significant difference in the perceived learning challenges through MOOCs between teachers across the arts and science streams in central universities of North East India.*

Table 4.47

Teachers’ perception of the learning challenges of MOOCs with respect to the differences in streams of study

Streams of study	Learning challenges on MOOCs			
	Agree	Disagree	Undecided	Total
Art	52	29	26	107
Sciences	62	25	12	99
Total	114	54	38	206

Table 4.47 presents the distribution of responses regarding perceived learning challenges of MOOCs across arts and science teachers.

Table 4.48

Computation of chi-square value on teachers' perception of the learning challenges of MOOCs based on the streams of study

χ^2	df	Level of significance
6.03	2	0.05 = 5.991

As shown in Table 4.48, the computed chi-square value 6.03 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance. This indicated a statistically significant difference between the arts and sciences teachers with respect to their perception of learning challenges in MOOCs. Consequently, the null hypothesis (H_{016}), which stated that “*there is no significant difference in the perceived learning challenges of MOOCs between teachers across arts and science streams in central universities of North East India,*” was rejected. The findings of the study showed that while both groups acknowledged the existence of challenges, science teachers showed stronger agreement as compared to their arts streams counterparts.

Qualitative Insights: *The qualitative findings provide further depth to this result. Science teachers frequently emphasized technical and structural barriers, particularly poor internet connectivity, inadequate institutional infrastructure, and difficulties in monitoring student engagement and assignments. They also voiced concerns over high dropout rates, reflecting a critical perspective on the operational sustainability of MOOCs. Arts teachers, by contrast, tended to highlight pedagogical and accessibility-related concerns, including limited tutor interaction, lack of personalized course content, language barriers, and inadequate provisions for learners with disabilities. The relatively larger proportion of undecided responses among arts faculty may indicate varied personal experiences or uncertainty about the extent of these challenges, pointing toward a nuanced perception shaped by differences in pedagogical expectations.*

Sub-Objective 7 (c): To compare university teachers' perceptions of MOOCs pedagogy with respect to teaching experience.

H₀₁₇: There is no significant difference in the perception of the motivation for learning in MOOCs between teachers with above ten years of teaching experience and below ten years in central universities of North East India.

Table 4.49

Teachers' perception of motivation for learning in MOOCs with respect to teaching experience

Teaching Experiences	Learning motivation on MOOCs			Total
	Agree	Disagree	Undecided	
Below 10 years	100	0	0	100
Above 10 years	97	3	0	100
Total	197	3	0	200

Table 4.49 displays the perceptions of teachers with different ranges of teaching experience regarding their motivation to learn through MOOCs.

Table 4.50

Computation of chi-square value on teachers' perception of motivation for learning on MOOCs based on teaching experience

χ^2	df	Level of significance
3.05	2	0.05 = 5.991

As shown in Table 4.50, the computed chi-square value 3.05 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is said to be non-significant. Therefore, the null hypothesis (H_{017}), which stated that “*there is no significant difference in the perception of motivation for learning in MOOCs between teachers with above ten years of teaching experience and those with below ten years,*” was accepted. The findings of the study showed that both groups, teachers with less than ten years of experience and those with more than ten years, highly agreed that MOOCs serve as an important source of learning motivation.

Qualitative Insights: The qualitative evidence supports this quantitative outcome. Insights from teacher interviews revealed that educators, regardless of their teaching tenure, shared similar motivational drivers for participating in MOOCs. These included the desire to enhance subject expertise, further professional growth, and strengthen career prospects through continuous knowledge enrichment. The consistency of perceived motivations across both experience groups reaffirms that teaching tenure does not significantly shape attitudes toward the motivational potential of MOOCs.

H_{018} : *There is no significant difference in the perception of the benefits of learning through MOOCs between teachers with above ten years of teaching experience and those with below ten years in central universities of North East India.*

Table 4.51

Teachers' perception of the benefits of learning through MOOCs with respect to teaching experience

Teaching Experiences	Benefits of learning through MOOCs			
	Agree	Disagree	Undecided	Total
Below	97	0	2	99
Above	80	7	8	95
Total	177	7	10	194

Table 4.51 illustrates the responses of teachers across different teaching experience groups on the benefits of MOOCs.

Table 4.52

Computation of chi-square value on teachers' perception of the benefits of learning through MOOCs based on teaching experience

χ^2	df	Level of significance
12.16	2	0.05 = 5.991

Table 4.52 shows that the computed chi-square value 12.16 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance. This indicates a

statistically significant difference in perceptions. Hence, the null hypothesis (H_{018}), which states that “*There is no significant difference in the perception of the benefits of learning through MOOCs between teachers with above and below ten years of teaching experience,*” was rejected. Teachers with less than ten years of experience overwhelmingly agreed on the benefits, with only a small number undecided. In contrast, teachers with more than ten years of experience showed relatively lower levels of agreement, with a greater proportion expressing disagreement or uncertainty compared to their junior counterparts.

Qualitative Insights: *The qualitative data provide support for this statistical finding. Teachers across both experience groups acknowledged MOOCs as beneficial, primarily for providing supplementary knowledge, professional enrichment, and broader exposure to global academic resources. However, a divergence in views emerged regarding the extent of these benefits. Less experienced teachers tended to highlight the usefulness of MOOCs for career advancement and innovative teaching, reflecting optimism toward adopting new learning technologies. Conversely, more experienced teachers expressed reservations, pointing to limited formal recognition of MOOCs in university systems and challenges in integrating MOOC-based learning into established teaching practices. This disparity suggests that while MOOCs are widely recognized as beneficial, teaching experience influences the intensity and framing of perceived benefits, with less experienced teachers showing stronger favorability compared to their senior counterparts.*

H₀₁₉: There is no significant difference in the perception of learning challenges through MOOCs between teachers with above ten years of teaching experience and those with below ten years in central universities of North East India.

Table 4.53

Teachers' perception of the learning challenges of MOOCs with respect to teaching experience

Teaching Experiences	Learning challenges on MOOCs			Total
	Agree	Disagree	Undecided	
below	48	24	29	101
above	57	31	9	97
Total	105	55	38	198

Table 4.53 highlights the perceptions of teachers across different teaching experience groups regarding the challenges of MOOCs.

Table 4.54

Computation of chi-square value on teachers' perception of the learning challenges of MOOCs based on teaching experience

χ^2	df	Level of significance
12.11	2	0.05 = 5.991

As presented in Table 4.54, the computed chi-square value 12.11 is greater than the critical value 5.991 with = 2 at 0.05 level of significance. This indicates a statistically significant difference between teaching experience and perceptions of MOOC-related learning challenges. Therefore, the null hypothesis (H_{019}), which stated, “*There is no significant difference in the perception of learning challenges through MOOCs with respect to teaching experiences,*” was rejected. The findings of the study revealed that teachers with less than ten years of experience showed a higher proportion of undecided responses, whereas teachers with more than ten years of experience expressed stronger agreement that MOOCs involve significant learning challenges.

Qualitative Insights: The qualitative findings reinforce these results. Teachers with more than ten years of experience often emphasized technical and structural barriers, such as unreliable internet connectivity, inadequate institutional infrastructure, and difficulties in monitoring learner engagement and assignment completion. The relatively larger proportion of undecided responses among less-experienced teachers suggests that many are still forming judgments based on limited personal exposure to MOOCs. Across both groups, however, there was agreement that MOOCs face a broader issue of limited recognition as credit-bearing courses within the university system. Nevertheless, the findings demonstrate that the nature, focus, and perceived intensity of challenges differ systematically by teaching experience, with more experienced teachers expressing sharper concerns about structural and operational barriers, and less experienced teachers placing greater emphasis on pedagogical and learner-centric issues.

Sub-Objective 7 (d): To compare university teachers' perceptions of MOOCs learning design with respect to gender.

H_{020} : There is no significant difference in the perceived learning design of MOOCs between male and female teachers in central universities of North East India.

Table 4.55

Teachers' perception of the learning design of MOOCs with respect to gender

Gender	Learning design of MOOCs			
	Agree	Disagree	Undecided	Total
Male	74	15	13	102
Female	88	5	8	101
Total	162	20	21	203

Table 4.55 presents the distribution of teachers' perceptions of the learning design of MOOCs with respect to gender.

Table 4.56

Computation of chi-square value on teachers' perception of the learning design of MOOCs based on gender

χ^2	df	Level of significance
7.40	2	0.05 = 5.991

As seen in Table 4.56, the computed chi-square value 7.40 is greater than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, there is a statistically significant difference in perceptions of learning design of MOOCs based on gender. Consequently, the null hypothesis (H_{020}), which stated, “*There is no significant difference in the perception of MOOC learning design between male and female teachers,*” was rejected. The study revealed that while both male and female teachers largely agreed on the effectiveness of MOOC learning design, a relatively higher proportion of male teachers expressed disagreement or uncertainty compared to their female counterparts.

Qualitative Insights: *The qualitative evidence provides further support for this quantitative result. Teachers highlighted that MOOCs promote collaborative peer learning, enhance ICT-based teaching practices, and provide an accessible interface design that supports ease of use. Female teachers appeared to view these design features more positively, with emphasis on inclusivity and user-friendliness, while male teachers expressed comparatively greater reservations, including concerns about practical implementation and adaptability of MOOCs into existing teaching structures.*

H₀₂₁: There is no significant difference in perception of the development and implementation of learning on MOOCs between male and female teachers in central universities of North East India.

Table 4.57

Teachers' perception of the development and implementation of learning on MOOCs with respect to gender

Gender	Development and Implementation			Total
	Agree	Disagree	Undecided	
Male	62	18	20	100
Female	79	5	15	99
Total	141	23	35	199

Table 4.57 illustrates the distribution of male and female teachers' responses regarding the development and implementation of learning on MOOCs.

Table 4.58

Computation of chi-square value on teachers' perception of the development and implementation of learning on MOOCs based on gender

χ^2	df	Level of significance
10.11	2	0.05 = 5.991

As shown in Table 4.58, the computed chi-square value 10.11 is greater than the critical chi-square value of 5.991 with $df = 2$ at the 0.05 level of significance. This result indicates a statistically significant difference between male and female teachers' perceptions. Thus, the null hypothesis (H_{021}), which stated that “*there is no significant difference in the perception of development and implementation of learning on MOOCs between male and female teachers in central universities of North East India,*” was rejected. The findings revealed that while both groups responded positively overall, female teachers reported a higher level of agreement, with substantially fewer instances of disagreement compared to their male counterparts.

Qualitative Insights: The qualitative findings further substantiate this conclusion. Teachers emphasized that MOOCs, particularly through the SWAYAM platform were effective for supporting the teaching-learning process. They noted that instructions and course guidelines were clear, course materials could be downloaded easily, and the built-in assessment mechanisms were perceived as fair and authentic. Female teachers tended to emphasize these supportive aspects more strongly, highlighting the accessibility and clarity of the platform, whereas male teachers expressed relatively more reservations about consistency in implementation and long-term integration with traditional systems.

Sub-Objective 7 (e): To compare university teachers' perceptions of MOOCs learning design with respect to streams of study.

H₀₂₂: There is no significant difference in the perception of the learning design of MOOCs between teachers across the arts and science streams in central universities of North East India.

Table 4.59

Teachers' perception of the learning design of MOOCs with respect to streams of study

Streams of study	Learning design of MOOCs			Total
	Agree	Disagree	Undecided	
Art	76	10	15	101
Sciences	80	16	5	101
Total	156	26	20	202

Table 4.59 highlights the perceptions of teachers from arts and science streams regarding the learning design of MOOCs.

Table 4.60

Computation of chi-square value on teachers' perception of the learning design of MOOCs based on the streams of study

χ^2	df	Level of significance
6.49	2	0.05 = 5.991

As shown in Table 4.60, the computed chi-square value 6.49 is greater than the critical value of 5.991 with $df = 2$ at the 0.05 level of significance. This indicates a statistically significant difference in the perceptions of learning design between arts and science teachers. Therefore, the null hypothesis (H_{022}), which stated that, “*There is no significant difference in the perception of learning design between arts and sciences teachers in central universities of North East India,*” was rejected. The findings of the study showed that while agreement was high in both streams, differences in patterns emerged, with science teachers showing a higher proportion of agreement, whereas arts teachers reported a relatively larger share of undecided responses.

Qualitative Insights: *The qualitative findings support this interpretation. Teachers noted that MOOCs encouraged a structured approach to learning by aligning course content with learning objectives and measurable outcomes. In addition, MOOCs fostered collaborative peer learning by engaging participants in shared discussions and activities. However, subtle disciplinary differences were evident. While science stream teachers tended to emphasize the clarity and structured design of MOOCs, arts stream teachers were more varied in their views, with some expressing uncertainty about the adaptability of MOOCs to diverse learner needs.*

H_{023} : *There is no significant difference in the perception of the development and implementation of learning on MOOCs between teachers across arts and science streams in central universities of North East India.*

Table 4.61

Teachers’ perception of the development and implementation of learning on MOOCs with respect to streams of study

Streams of study	Development and Implementation			Total
	Agree	Disagree	Undecided	
Arts	70	11	19	100
Sciences	64	18	17	99
Total	134	29	36	199

Table 4.61 summarizes the responses of arts and science teachers regarding the development and implementation of MOOCs.

Table 4.62

Computation of chi-square value on teachers' perception of the development and implementation of learning on MOOCs based on the streams of study

χ^2	df	Level of significance
2.06	2	0.05 = 5.991

As shown in Table 4.62, the computed chi-square value 2.06 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. This indicates that there is no significant difference. Therefore, the null hypothesis (H_{023}), which states that, “*there is no significant difference in perception of MOOC development and implementation between teachers across arts and science streams in central universities of North East India,*” was accepted. The findings showed that both streams showed relatively similar proportions of agreement, disagreement, and undecided responses, with slight variations in disagreement levels.

Qualitative Insights: *The qualitative findings reinforce these results. Teachers from both streams highlighted the value of MOOCs in providing high-quality and innovative content, which they regarded as enriching for course delivery. However, they noted the necessity of adequate teacher training, especially in handling MOOCs on platforms like SWAYAM, to ensure effective integration into existing curricula. Additionally, teachers emphasized the role of peer collaboration and idea sharing, which MOOCs have facilitated, in supporting their own professional work.*

Sub-Objective 7 (f): To compare university teachers' perceptions of MOOCs learning design with respect to teaching experience.

H₀₂₄: There is no significant difference in the perceived learning design of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India.

Table 4.63

Teachers' perception of the learning design of MOOCs with respect to teaching experience

Teaching Experience	Learning design of MOOCs			
	Agree	Disagree	Undecided	Total
Below	83	7	10	100
above	75	13	12	100
Total	158	20	22	200

Table 4.63 reveals the distribution of responses regarding teachers' perceptions of the learning design of MOOCs according to teaching experience.

Table 4.64

Computation of chi-square value on teachers' perception of the learning design of MOOCs based on the teaching experience

χ^2	df	Level of significance
2.39	2	0.05 = 5.991

According to Table 4.64, the computed chi-square value 2.39 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant. Consequently, the null hypothesis (H_{024}), which states, "there is no significant difference in the perceived learning design of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India," was accepted. Both groups, teachers with less than ten years and those with more than ten years of teaching expressed high levels of agreement about the effectiveness of MOOC learning design, with only slight variations in the proportions of disagreement and undecided responses.

Qualitative Insights: Qualitative findings lend support to this conclusion. Teachers across both experience groups emphasized that MOOCs are designed to promote collaborative and outcome-based learning, with course structures aligned to clearly defined objectives. Peer interaction within MOOCs was also reported to strengthen teachers' familiarity with digital and ICT-enabled methods, which they considered valuable for modern classroom practices. In essence, teachers having ten years above teaching experience and ten years below regard the learning design of MOOCs in a similarly positive manner, indicating that teaching experience does not substantially influence perceptions of MOOC design effectiveness.

H_{025} : *There is no significant difference in the perception of the development and implementation of learning on MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India.*

Table 4.65

Teachers' perception of the development and implementation of learning on MOOCs with respect to teaching experience

Teaching Experiences	Development and Implementation			
	Agree	Disagree	Undecided	Total
Below	74	6	20	100
Above	67	15	17	99
Total	141	21	37	199

Table 4.65 shows the distribution of responses on the development and implementation of MOOCs based on teaching experience.

Table 4.66

Computation of chi-square value on teachers' perception of the development and implementation of learning on MOOCs based on the teaching experience

χ^2	df	Level of significance
4.44	2	0.05 = 5.991

According to Table 4.66, the computed chi-square value 4.44 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. This indicates no statistically significant difference. Therefore, the null hypothesis (H_{025}), which states “*there is no significant difference in the perception of the development and implementation of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India,*” was accepted. The findings of the study revealed that although both groups, teachers with less than ten years and those with more than ten years of experience expressed strong agreement on the value of MOOCs, minor differences emerge: relatively more senior teachers expressed disagreement compared to junior faculty, who were more inclined to remain undecided.

Qualitative Insights: *Qualitative insights further validate this outcome. Teachers across both experience groups reported that MOOCs provide clear and structured information guides, access to e-books and web resources, and transparent assessment processes, all of which contribute to fair and credible evaluation. Respondents also emphasized the absence of major cultural or institutional resistance when adopting MOOCs, suggesting that the platform is perceived as adaptable to diverse teaching-learning contexts. Overall, the findings demonstrate that perceptions of development and implementation do not significantly differ based on teaching experience, with both senior and junior faculty regarding MOOCs as supportive, accessible, and fairly implemented platforms for modern teaching.*

The overall findings of the study present a consolidated summary of the data collected through both qualitative and quantitative approaches in the research. This integrates the key results from students' and teachers' responses, highlighting status, problems, perceptions, and measurable outcomes related to the research objectives.

The combination of statistical analysis and descriptive insights provides a comprehensive understanding of the phenomenon under study. By summarizing the main trends and observations in a tabular form, this enables an easier interpretation of the results and offers a holistic view of the impact and implications derived from the study as shown in Table 4.67.

Table 4.67

Overall Findings of Quantitative and Qualitative Data

S/No	Objectives	Quantitative Findings	Qualitative Findings
1.	To assess the status of MOOCs in central universities of North East India.	• Out of 320 students surveyed, 197 (61.6%) were aware of MOOCs • 65 students (20.3%) had enrolled in MOOCs. • 100% of 64 teachers were aware of MOOCs • 27 teachers (42.2%) had enrolled. • 46.7% of students identified teachers as a primary source of information regarding MOOCs.	• Mizoram and Nagaland Universities had limited infrastructure. • NEHU established a studio by 2022–23 with 2 courses planned but differs across departments. • Manipur University had a functioning host centre (EMMRC), created 78 MOOCs, and reached over 100,000 enrollees. • Infrastructure, trained staff, and course credits varied considerably.
2.	To examine the plans and programmes	• All four universities passed Academic Council resolutions	• Mizoram University began integration of SWAYAM-MOOC

S/No	Objectives	Quantitative Findings	Qualitative Findings
	formulated by the central universities of North East India to implement MOOCs in their university.	aligning with the 2021 UGC Credit Framework. • However, no such detailed information was disclosed due to the statement of confidentiality. • Numerous seminars and workshops were reported.	courses from 2025 with nine PG programs. • Nagaland University planned awareness seminars owing to lack of host institute. • NEHU developed and offer MOOC courses under its faculty. • Manipur's EMMRC produced multiple MOOCs but awaited funding for expansion. Teachers widely supported but noted operational funding and manpower issues as limiting factors.
3.	To reveal issues in connection with the design, development, and implementation of MOOCs in central	• Majority (92.2%) had neither prepared nor created MOOCs and had not received any training for designing and developing MOOCs, respectively.	• Teachers cited lack of institutional training and infrastructure, difficulty recording lectures, and time constraints. • Some mentioned challenges with co-ordination and

S/No	Objectives	Quantitative Findings	Qualitative Findings
	universities of North East India.	85.9% had reported the lack of institutional support staff for developing and providing MOOCs. - Majority (90.6%) of respondents indicated inadequate institutional infrastructure for running MOOCs, 89.1% confirmed that MOOCs are not integrated as regular courses. - Majority (92.7%) of the respondents stated that their institutions were not directly involved in hosting and delivery of MOOC courses and conducting examination.	awareness among students and teachers. Respondents emphasized need for trained technical staff, facilities like studios, and improved evaluation and feedback mechanisms.
4.	To assess university students' perceptions of learning	Students with no prior experience found MOOCs interesting (21.3%) and helpful (21.3%)	Students expressed that MOOCs enhanced self-learning, discipline, and employability.

S/No	Objectives	Quantitative Findings	Qualitative Findings
	through MOOCs.	- Enrolled learners viewed them helpful (21.7%), interesting (19%), important (15%) - Perceived positive effects on confidence, flexibility, and relevance to careers.	- While valuing flexibility and supplementary learning, they reported difficulties such as unstable internet, inadequate interactions with instructors and issues with managing assignments. - Prior MOOC users demonstrated more practical appreciation, considering MOOCs helpful for skills and job preparation.
5.	To compare university students' perceptions of learning through MOOCs with respect to gender and streams of study.	Across five dimensions (motivation, importance, benefits, expectations, challenges), chi-square values were below 5.991, showing no significant differences with	- Focus groups confirmed uniform positive attitudes: MOOCs enhanced discipline, motivation, and flexibility regardless of gender/discipline. - Both Arts and Science streams recognized job relevance and

S/No	Objectives	Quantitative Findings	Qualitative Findings
		respect to gender and streams of study.	accessibility but cited identical challenges like connectivity and balancing coursework.
6.	To assess the perceptions of university teachers of central universities of North East India on MOOCs' pedagogy and learning design.	• 18.3% of teachers perceived MOOCs to be challenging. • While, 16.3% and 15.9% of teachers opined that MOOCs are interesting and helpful for knowledge enhancement. • 13.6% of the total teacher respondents perceived MOOCs as important for further upskilling and boosting their confidence in online learning courses. • With 10.8%, 10.4% and 9.1% respectively, the teacher respondents opined that MOOCs seem to be both difficult and	• Qualitative interviews revealed unanimous appreciation of MOOCs' clarity, accessibility, and design alignment. • All participants supported MOOCs as innovative professional tools enhancing teaching quality.

S/No	Objectives	Quantitative Findings	Qualitative Findings
		encouraging for knowledge development, and these online learning courses changed their view with regard to the digital learning innovation. On the contrary, only a few of the teachers opined that MOOCs were confusing (4%) and thought-provoking (1.5%)	
7.	To compare university teachers' perceptions of MOOCs' pedagogy and learning design with respect to gender, streams of study, and teaching experiences.	- Significant differences for perceived benefits, perceived learning challenges and pedagogy of learning design, development and implementation across gender. - Significant difference found for perceived learning challenges and	- Interviews emphasized that teachers valued MOOCs for professional enrichment and ICT integration across gender, streams of study and teaching experiences. - Arts faculty sought adaptation flexibility, whereas science faculty praised

S/No	Objectives	Quantitative Findings	Qualitative Findings
		learning design between arts and science teachers.	content structure.
		• Significant difference found for perceived benefits and perceived learning challenges across teaching experiences - ten years above and ten years below.	• Teachers stressed need for institutional support, resource access, and consistent training to enhance implementation success.

CHAPTER-V

MAJOR FINDINGS, DISCUSSIONS, SUGGESTIONS AND CONCLUSION

CHAPTER-V

MAJOR FINDINGS, DISCUSSIONS, SUGGESTIONS AND CONCLUSION

5.0. Introduction

This chapter addresses the major findings, discussions, limitations, and suggestions for future research. To fulfill the study's objectives, data were collected using self-developed tools and analyzed with appropriate methods to test the hypotheses. From the results presented previously, this chapter offers a comprehensive interpretation of the findings. This chapter includes a summary of key findings supported by relevant evidence, a discussion framed within relevant triangulation process, specific recommendations based on the results of the study of Massive Open Online Courses in central universities of North East India in relation to their status, problems and perceptions of students and teachers, and finally concluding remarks and identifying potential areas proposing directions for future research to expand or complement this study.

5.1. Findings Related to the Status of MOOCs in Central Universities of North East India:

5.1.1. Findings related to the status of students' awareness of MOOCs

- The results showed that out of the 320 surveyed students, 197 respondents, with 61.6%, were aware of MOOCs.
- Out of the 197 respondents who were found to have awareness of MOOCs, 60.9% (120) student respondents were from the arts streams, while 39.1% (77) were from the sciences stream.
- Moreover, the findings of the study also highlighted that out of the 197 respondents, 57.9% (114) were females and 42.1% (83) were males.
- From these findings, it can be seen that more than half of the surveyed students in the central universities of North East India were found to be aware of MOOCs. The results of the study showed that the students from arts were

found to be more aware of MOOCs than sciences students, and that female students were more aware of MOOCs than their male counterparts.

5.1.2. Findings related to status of students' enrolment in MOOCs

- The findings of the study revealed that only few students, 65 (20.3%) out of the 320 surveyed students had enrolled in MOOCs, with 10.9% (35) being female and 9.4% (30) being male.
- Moreover, with regards to the streams of study, 11.6% (37) were from the sciences stream, while 8.8% (28) of the students enrolled in MOOCs were from the arts stream.
- Overall, the findings of the study suggested a low enrollment rate of students in SWAYAM-MOOCs in the central universities of North East India.

5.1.3. Findings related to students' source of knowledge of MOOCs

- Among the 61.6% (197 students) who have awareness of MOOCs, 46.7% (92 students) identified teachers as the primary source of information regarding MOOCs.
- This statistic highlights the pivotal role of teachers in promoting students' awareness of the importance, benefits, and potential career opportunities associated with MOOCs within the educational environment.
- Following teachers, the internet was found to rank as the second most significant source of knowledge, with 25.38% (50 students) attributing their understanding of MOOCs to online resources. This highlights the growing impact of digital platforms in educating students about educational innovations, such as MOOCs.
- The study also revealed that 16.24% (equivalent to 32 students) relied on their friends as their primary source of information about Massive Open Online Courses (MOOCs). This finding highlights the significant impact that peer groups have on both knowledge acquisition and the development of understanding in the contemporary educational landscape.

- Ranking fourth, with 6.59% (13 students), the university administration holds a significant position among various sources of knowledge,
- The study also found that family comes next in this hierarchy with 3.04%, demonstrating its role in knowledge sharing.
- On the other hand, the study showed that newspaper, with 2.03% was found to be positioned at the bottom, suggesting a lesser influence in this context.

5.1.4. Findings related to the students' awareness of online educational platforms

- It was found that SWAYAM, with 31.6%, was considered the most popular among the listed educational platforms.
- Following that, Udemy, NPTEL, and Coursera were the most popular among the respondents, receiving 16.9%, 15%, and 13.8% of the votes, respectively.
- OpenLearn was known to 10.3% of the respondents.
- edX and Udacity was known to 8.1% and 7.5% respectively.
- Only few with 5.3% were known to FutureLearn.
- The findings of the study revealed that the respondents recognized other educational platforms, indicating a broader awareness of online learning options.

5.1.5. Findings related to the status of teachers' awareness and enrollment of MOOCs

- The results showed that all the 64 teachers surveyed (100%) in the central universities of North East India were aware of MOOCs.
- Out of the 64 teacher respondents, it can be seen that 42.2% (27) had enrolled in MOOCs, with 29.7% (19) being males and 12.5% (8) being females. The results showed that 25% (16) who had enrolled in MOOCs were from the arts streams, and 17.2% (11) were from the sciences streams. Moreover, the findings of the study also highlighted that 32.8% (21) were those having more

than ten years of teaching experience, while only 9.4% (6) teachers who had enrolled in MOOCs were those having ten years below teaching experience.

- Overall, the findings of the study suggested that despite the widespread awareness of MOOCs, there was a low enrolment rate of teachers in SWAYAM-MOOCs in the central universities of North East India.
- The findings showed that among the teacher respondents, a higher number of arts teachers enrolled in MOOCs than sciences teachers. It was also found that a higher number of male teachers enrolled in MOOCs than their female counterparts. Furthermore, teachers with above ten years of teaching experience (32.8%) enrolled in MOOCs in higher number than their counterpart with below ten years of teaching experience (9.4%).
- Additionally, 23.4% (15 out of the 64 teacher respondents) were found to obtain their online learning completion certificate.

5.1.6. Findings related to the status of MOOCs at Mizoram University, Nagaland University, North Eastern Hill University, and Manipur University

❖ Mizoram University

- Despite the increased awareness of Massive Open Online Courses (MOOCs) within the institution, feedback on the status of Mizoram University as a Host Institution was assessed as fairly satisfactory, with scope for further improvement.
- In 2018, Ministry of Education, Government of India, sanctioned a National Resource Centre to the Department of Education, Mizoram University, for the development of MOOC courses under the Pandit Madan Mohan Malavya National Mission on Teachers and Teaching (PMMMNTT) for the Annual Refresher Programme in Teaching (ARPIT). Under this initiative, the Department developed 40 modules on Research Methodology in Education, which were uploaded on the SWAYAM platform as a non-credit MOOC course.
- However, based on interview data, participants perceived several shortcomings in essential infrastructure, particularly the lack of dedicated

facilities, inadequate recording studio provisions, and a shortage of trained staff to manage MOOC operations and course delivery. Additionally, interview evidence indicated that the university had not offered any MOOC credit courses under SWAYAM through its faculty and relied primarily on external platforms.

- In response to these challenges, the minutes of the 48th meeting of the Academic Council, AC:47:4(17) recorded a resolution approving the introduction of a SWAYAM Course as a compulsory paper in place of the Interdisciplinary Minor (IMN) course across both semesters, effective from the 2025-26 Academic Session. The course was approved to carry two credits, as noted by the respondent.

❖ **Nagaland University**

- Interview data indicated that the status of SWAYAM-MOOCs at Nagaland University was perceived as unsatisfactory.
- Participants reported that the university did not function as a Host Institution for offering MOOC courses through the SWAYAM platform. Interview evidence further suggested the absence of dedicated infrastructure, such as recording studios or specialized facilities, which are considered essential for the effective management and implementation of MOOC operations.
- In addition, participants indicated that the university had not offered any MOOC courses under SWAYAM through its own faculty and relied primarily on external platforms.
- Respondents also stated that students were encouraged to enroll in courses available on the SWAYAM-MOOCs portal for online learning, which had been operational for approximately four years. However, despite such encouragement, student participation remained limited. Regarding enrollment patterns, respondents indicated that approximately fifty-five students typically registered on the SWAYAM portal during their third and fourth semesters.

❖ **North-Eastern Hill University**

- Interview data indicated that the status of North-Eastern Hill University was assessed as moderately satisfactory as they had established the necessary provisions for functioning as a Host Institution for SWAYAM-MOOCs since the 2022-23 academic years.
- These provisions included essential infrastructure such as recording studios, equipment, facilities, and support personnel for the effective implementation and operation of MOOC courses.
- The university was at the initial stage of providing and delivery of MOOC courses. However, when asked about student enrollment in MOOCs, respondents were unable to provide precise figures, as MOOCs related activities were managed independently by different departments.
- With regard to the number of MOOC courses offered, respondents noted that only two courses had been planned for introduction under the SWAYAM-MOOCs framework.
- Additionally, respondents further commented that the availability of additional courses would depend on curriculum development processes, while the specific courses offered would be influenced by faculty areas of specialization, emphasizing the nature and number of MOOC courses may vary across departments.

❖ **Manipur University**

- Interview data indicated that the growth of Massive Open Online Courses (MOOCs), particularly SWAYAM-MOOCs, at Manipur University reflected a strong institutional commitment to the initiative and was assessed as highly satisfactory.
- Participants reported that the university functioned as a Host Institution for offering SWAYAM-MOOC courses through the Educational Multimedia Research Centre (EMMRC), one of the twenty-two media centres established on campus by the University Grants Commission.
- The availability of well-developed facilities, including recording studios, infrastructure, faculty expertise, and support personnel, was perceived to have

effectively supported the implementation, management, and operation of MOOC courses.

- An interview with the MOOC Coordinator revealed that student enrolment in the SWAYAM-MOOCs offered through the Educational Multimedia Research Centre (EMMRC) had exceeded 100,000 learners. Moreover, respondents reported that the university had actively contributed to MOOC development, having launched a total of 78 courses under the SWAYAM platform as of January 2024.
- Furthermore, interview evidence suggested that the design, development, and delivery of MOOC courses at Manipur University were aligned with UGC *Credit Framework for Online Learning Courses through SWAYAM* Regulations (2016) and the SWAYAM Guidelines (2017).

5.2. Findings Related to Plans and Programmes Formulated by the Central Universities of North East India:

5.2.1. Mizoram University

- In the case of Mizoram University, information related to MOOC implementation was obtained from the Academic and Conference Section of the university. Documentary evidence indicated that during the 31st meeting of the Academic Council held on 25th November 2016, the Council resolved to approve the implementation of the UGC-*Credit Framework for Online Learning Courses through SWAYAM*, Regulations, 2016, with effect from the subsequent academic session. Furthermore, the minutes of the 33rd meeting of the Academic Council held on 7th December 2017, with reference to the meeting minutes page 22, AC:33:4(11), recorded approval, in principle, for the introduction of Massive Open Online Courses (MOOCs) in undergraduate and postgraduate programmes, subject to certain modifications discussed during the meeting. The resolution proposed that a minimum of two MOOCs be made compulsory, preferably in the second and third semesters, with credit limits specified under the Choice Based Credit System (CBCS). Regarding credits, it should not be more than 2 credits (for 6 months course) and 4

credits (for 1 year course), with a minimum of 4 credits and a maximum of 8 credits, be given in addition to the regular credits under CBCS specified for the particular course.

- Interview data suggested that although policy approval was granted earlier, full-fledge adoption and integration of MOOCs commenced from the 2025 academic session. Respondents indicated that postgraduate programmes across nine schools of the university had registered for SWAYAM courses during this period.
- Regarding plans and programs, the Faculty Development Centre, under the School of Education, had conducted two workshops on designing and developing MOOC courses. Similarly, the School of Education at Mizoram University had conducted a seminar on MOOC design, development, and delivery in collaboration with National Institute of Educational Planning and Administration (NIEPA).
- With regard to capacity-building initiatives, respondents reported that the Faculty Development Centre under the School of Education had conducted two workshops on the design and development of MOOC courses. In addition, the School of Education organized a seminar on MOOC design, development and delivery in collaboration with the National Institute of Educational Planning and Administration (NIEPA).
- Furthermore, during interviews with the Head of the Department of Education, reference was made to the establishment of a National Resource Centre under Pandit Madan Mohan Malivya National Mission on Teachers and Teaching (PMMMNM TT). Respondents noted that the centre had developed forty videos and forty e-learning materials for a non-credit MOOC course under the Annual Refresher Programme in Teaching (ARPIT) for in-service higher education teachers, administered by the Ministry of Education, Government of India.

5.3.2. Nagaland University

- In the case of Nagaland University, interview data suggested that the university was not functioning as a Host Institution for MOOCs at the time of

the study, which limited the scope for full-fledge implementation. However, respondents indicated that preliminary planning was underway to enable students to enroll in MOOC courses in the near future. According to one respondent, the immediate institutional plan focused on raising student awareness of MOOCs through regular seminars conducted four times a year, i.e., twice per semester.

- Additionally, it is worth noting that university officials had initiated seminars and workshops to formulate long-term strategies for MOOC implementation. Despite the absence of studio facilities, dedicated infrastructure, and trained personnel or staff members, respondents reported that efforts were made to familiarize students with MOOCs by facilitating their registration on the SWAYAM portal.

5.3.3. North Eastern Hill University

- Interview data suggested that MOOCs were formally introduced at North-Eastern Hill University during the 2022-2023 academic years, preliminary discussions and planning had begun prior the Covid-19 lockdown in 2020. Respondents reported that efforts were underway to establish the university as a Host Institution, and a dedicated studio for MOOC development had been set up, along with the necessary infrastructure, staff, and other personnel for recording and reviewing course content.
- Participants reported that the Department of Science was among the first to begin recording and offering MOOC courses, while other departments, including the Department of Education, were in various stages of development. At the time of data collection, respondents noted that the Department of Education was in the process of developing its first two SWAYAM courses and had yet to officially offer MOOCs. In contrast, other departments had begun running their respective programs.
- Regarding student sensitization strategies, respondents reported that initiatives were taken to inform students about MOOCs during orientation, emphasizing the opportunity to earn additional credits. Regular updates were

also provided at the beginning of each academic year. Furthermore, programs such as seminars and conferences related to MOOC awareness were also conducted. Measures had also been taken to include teachers in this regard, through initiatives such as faculty workshops, as well as encouraging them to enroll in online courses to promote MOOCs and for better understanding. Consequently, respondents further commented that a total of fourteen seminars, workshops, and faculty training programmes had been organized to date. However, precise data on student enrollment across departments were not readily available.

5.3.4. Manipur University

- Data collected through interview evidence reported that Manipur University had established a comparatively advanced framework for MOOC implementation through the Educational Multimedia Research Centre (EMMRC). Respondents reported that the university possessed well developed infrastructure, including a dedicated building for MOOCs, recording studios, recording gadgets, and specialized personnel such as MOOC faculty members, subject experts, presenters, editors, and production teams. Participants also indicated that faculty members from other universities collaborated in the development of MOOC materials.
- Respondents further reported that workshops and seminars were regularly organized to create awareness among faculty members and students, ensuring adherence to University Grants Commission guidelines. Although the university had already launched several MOOC initiatives, respondents indicated that further expansion was contingent upon the availability of additional funding, which was viewed as essential for sustaining and scaling MOOC development.
- In addition, interview data suggested that the MOOC Coordinator had conducted lectures and training session on the integration of technology in education, MOOC development processes, and compliance with regulatory requirements, including proposal submission, expert review, and alignment with UGC standards. Despite the impressive initiatives already taken at the

university, respondents emphasized the need for further improvements in staff organization, course availability, credit transfer mechanisms, and alignment with Ministry of Education guidelines.

5.3. Findings Related to the Issues in Connection with the Design, Development, and Implementation of MOOCs in Central Universities of North East India:

5.3.1. Issues with the Designing of MOOCs

- All the 64 teacher respondents (100%) were found to be aware of the MOOC courses.
- However, majority (92.2%) had neither prepared nor created MOOCs and had not received any training for designing and developing MOOCs, respectively.
- This indicated a significant gap between the awareness level of MOOCs and the actual involvement of teachers due to a lack of institutional support.
- This is evident in the given data, where 85.9% had reported the lack of institutional support staff for developing and providing MOOCs, while only 14.1% reported having the required supporting staff for designing and developing MOOCs.
- Thus, the findings revealed a high level of theoretical awareness about MOOC courses, but a very low level of actual participation, involvement, training and institutional support for the proper and smooth operation of MOOCs among teachers.

5.3.2. Issues with the Development of MOOCs

- The findings showed that one major significant issue reported by the teacher respondents is the lack of necessary infrastructural equipment for developing MOOCs as per the UGC Regulations 2016.
- Majority (90.6%) of respondents indicated inadequate institutional infrastructure for running MOOCs, and 89.1% confirmed that MOOCs are not integrated as regular courses.

- Furthermore, the absence of skill-based offerings on SWAYAM and low student enrollment is another significant challenge, with 89.1% of teacher respondents reporting issues.
- Additionally, 87.5% reported that available MOOCs fail to incorporate essential components like e-tutorials, e-content, discussion forums, and assessments, compounded by a lack of dedicated staff for course development, leading faculty to rely directly on SWAYAM portal registrations.

5.4.3. Issues with the Implementation of MOOCs

- Although the University Grants Commission has given clear cut direction to the universities to implement MOOCs, one of the major significant challenges reported is host institution.
- Majority (92.7%) of the respondents stated that their institutions were not directly involved in hosting and delivery of MOOC courses and conducting examination.

Qualitative Insights:

It was evident that the measures implemented so far regarding MOOCs in central universities of North East India left much to be desired. At the time of data collection for the study, i.e, six to seven years after the UGC has laid down the *Credit Framework for Online Learning Courses through SWAYAM Regulations* (2016), it seemed to be a challenging initiative for the universities.

Although awareness of MOOCs was widely prevalent, widespread satisfactory integration is yet to be seen. The fundamental issue regarding MOOCs in these universities was this significant gap between knowing about MOOCs and its active practice or adoption. MOOCs have not yet been integrated enough to generate issues that were worth studying in depth. Additionally, there was also a significant gap among the universities in terms of MOOCs implementation, ranging from initial stage meetings to full swing adoption offering variety of courses.

There was a general lack of supporting staff at the institution level as well as training initiatives for designing, developing and providing MOOCs courses, resulting in a significant lack of teacher participation in creating these courses. Moreover, the institutions were not equipped with necessary infrastructure to run MOOC course, this was reflected by the fact that majority of the institution not offering a regular MOOC course. Further, majority of the universities were also not host institutes and therefore were not directly involved in hosting and delivery of MOOC courses and conducting examination. This had led to problems in finding out issues relating to MOOCs implementation, as majority of the questions regarding implementation issues were met with negative responses due to lack of implementation, and the revealed issues were only from the few universities that actually implement MOOCs.

Students' enrolment in SWAYAM-MOOC was also not satisfactory, and there was a lack of proper feedback mechanism for MOOCs from the student, both of which might be due to lack of awareness about MOOCs on the students' part.

Further concern noted was time constraint. For universities with no supporting staff from affiliated colleges, it was difficult for teachers to make time for MOOCs efforts on top of their regular teaching workload. Moreover, the recording process for MOOCs courses was also a challenge, as teachers were not used to present in front of cameras for recorded courses without proper training and practice.

Moreover, evaluation system was carried out by the National Testing Agency (NTA), making it difficult to track how many students completed their courses and received certificates based on institution, as it was an online format and students from various institutions participated.

Concerns regarding academic integrity and accountability in terms of students learning and examination process were also expressed, and a push for enhanced funding to facilitate more MOOC courses was also noted.

5.4. Findings Related to Students' Perception of Learning through MOOCs in Central Universities of North East India:

5.4.1. Responses and Opinions of Students having no prior knowledge of MOOCs

- Out of 320 student respondents, 21.3% of the students found MOOCs to be interesting and helpful, respectively.
- 13.7% and 13.3%, students opined that MOOCs were encouraging and important, respectively, for further studies and knowledge acquisition.
- However, a small number of students found MOOCs to be challenging (8.4%) and confusing (5.6%).
- 4% of the respondents reported that MOOCs changed their view towards online learning, 3.6% found it difficult, and 2.4% believed that it is stimulating.
- The remaining small fractions of the respondents opined that MOOCs were thought-provoking (1.8%), irrelevant (0.6%), off-putting (0.6%), and scary (0.8%).

5.4.2. Responses and Opinions of Students who are actively engaged in MOOCs

- The enrolled students who had knowledge and experience opined MOOCs to be very helpful (21.7%) for complementing their studies.
- Additionally, 19% and 15% of the enrolled students perceived MOOCs as interesting and important, respectively.
- 9.3% and 8.8% opined that MOOCs were both encouraging and challenging, respectively.
- 7.1% of the respondents reported that MOOCs changed their views toward online learning.
- 5.3% found it difficult, and the remaining small numbers opined that MOOCs were stimulating (3.1%), boring (3.1%), and thought-provoking (3.1%).

- 2.6% of the students found it confusing, while the remaining opined that MOOCs were irrelevant (0.9%) and off-putting (0.9%).

When comparing the students' opinions of MOOCs between students with and without prior knowledge, the data revealed that the majority of students without prior knowledge opined that MOOCs were both interesting and helpful, with 21.3% of students in each category. However, those with prior knowledge, 21.7% opined that MOOCs were found genuinely helpful in complementing their studies.

Additionally, those with prior knowledge showed a slight decline in opinions compared to those without prior knowledge; 19% and 15% of those with prior knowledge, respectively, opined that MOOCs were interesting and important. On the contrary, those without prior knowledge thought that MOOCs were encouraging and important, respectively, at 13.7% and 13.3%.

However, a decline was observed when compared to those with prior knowledge, where students reported that MOOCs were both encouraging and challenging, with a decline of 9.3% and 8.8%. Furthermore, a small number of students found MOOCs to be confusing (5.6%), changed their views (4%), difficult (3.6%), and stimulating (2.4%). Additionally, the remaining small fractions of the respondents opined that MOOCs were thought-provoking, irrelevant, off-putting, and scary for those without prior knowledge. However, students with prior knowledge did not agree with every word given to the statement, where they reported that MOOCs changed their views (7.1%), difficult (5.3%), stimulating (3.1%), boring (3.1%), and thought-provoking (3.1%). Additionally, words like "confusing" (2.6%), "irrelevant" (0.9%), and "off-putting" (0.9%) were also reported and expressed by students with prior knowledge about MOOCs.

5.5. Findings Related to the Comparison of University Students' Perceptions of Learning through MOOCs with respect to Gender and Streams of Study in Central Universities of North East India:

5.5.1. Comparisons of Students' Perceptions in relation to MOOCs with respect to Gender

1. Motivation:

- The computed chi-square value of 0.74 is less than the critical chi-square value of 5.991, with degrees of freedom = 2 at 0.05 level of significance. Hence, it is said to be non-significant.
- Consequently, the null hypothesis, which states, '*there is no significant difference in the perception of learning motivation on MOOCs between male and female students in the central universities of North East India,*' cannot be rejected.
- Hence, the null hypothesis (H_{01}) was accepted.

2. Perceived Importance:

- The computed chi-square value of 3.19 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis stating '*there is no significant difference in the perception of the importance of learning through MOOCs between male and female students in the central universities of North East India*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived importance of learning through MOOCs by male and female students.
- Hence, the null hypothesis (H_{02}) was accepted.

3. Perceived Benefits:

- The computed chi-square value of 1.10 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance.
- Thus, it is said to be non-significant, and therefore, the null hypothesis, which states '*there is no significant difference in the perception of the benefits of learning through MOOCs between male and female students in the central universities of North East India,*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived benefits of learning through MOOCs between male and female students.
- Hence, the null hypothesis (H_{03}) was accepted.

4. Learning Expectations:

- The computed chi-square value of 2.63 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis, which states '*there is no significant difference in the perception of learning expectations of MOOCs between male and female students in the central universities of North East India,*' cannot be rejected. Therefore, it can be concluded that there is no significant difference in the perceived learning expectations of MOOCs between male and female students.
- Hence, the null hypothesis (H_{04}) was accepted.

5. Perceived Challenges:

- The computed chi-square value of 3.11, presented in Table 4.23, is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Therefore, the null hypothesis, which states '*there is no significant difference in the perception of the learning challenges through MOOCs between male and female students in the central universities of North East India,*' cannot be

rejected. Consequently, there is no significant difference in the perceived learning challenges through MOOCs between male and female students.

- Hence, the null hypothesis (H_{05}) was accepted.

5.5.2. Comparisons of Students Perceptions in relation to MOOCs with respect to Streams of Study

1. Motivation:

- The computed chi-square value of 1.11 is much less than the critical chi-square value of 5.991, with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis, which states, '*there is no significant difference in the perception of learning motivation on MOOCs between arts and sciences students of the central universities of North East India,*' cannot be rejected as there is no significant difference between the perception of arts and sciences students in their motivation to learn on MOOCs.
- Hence, the null hypothesis (H_{06}) was accepted.

2. Perceived Importance:

- The computed chi-square value of 0.50 is much less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Therefore, the null hypothesis stating '*there is no significant difference in the perception of the importance of learning through MOOCs between arts and sciences students of the central universities of North East India*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived importance of learning through MOOCs by students from the arts and sciences streams.
- Hence, the null hypothesis (H_{07}) was accepted.

3. Perceived Benefits:

- The computed chi-square value of 0.42 is much less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Thus, it is said to be non-significant.
- Therefore, the null hypothesis, which states that '*there is no significant difference in the perception of the benefits of learning through MOOCs between arts and sciences students of the central universities of North East India,*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences students.
- Hence, the null hypothesis (H_{08}) was accepted.

4. Learning Expectations:

- The computed chi-square value of 1.68 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis, which states '*there is no significant difference in the perception of learning expectations of MOOCs between the arts and sciences stream,*' cannot be rejected. Therefore, it can be concluded that there is no significant difference in the perceived learning expectations of MOOCs between students from the arts and sciences streams.
- Hence, the null hypothesis (H_{09}) was accepted.

5. Perceived Challenges:

- The computed chi-square value of 3.42 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis, which states '*there is no significant difference in the perception of the learning challenges through MOOCs between the streams of arts and sciences,*' cannot be rejected. Consequently, there is no

significant difference in the perceived learning challenges through MOOCs between the students from the arts and sciences stream.

- Hence, the null hypothesis (H_{010}) was accepted.

Qualitative Insights: The analysis of students' perceptions of MOOCs across gender and streams of study in central universities of North East India revealed a high degree of consistency. Quantitative results showed no statistically significant differences in any of the five dimensions namely - motivation, perceived importance, perceived benefits, learning expectations, or perceived challenges based on either gender or streams of study. These findings are strongly corroborated by qualitative insights from focus group discussions, where students across all groups expressed similar motivations, benefits, expectations, and challenges. Both male and female students, as well as those from arts and sciences backgrounds, emphasized the role of teacher encouragement, self-paced learning, and personal development in motivating MOOC engagement. They uniformly recognized the value of MOOCs in enhancing academic and professional readiness, appreciated the accessibility and affordability of content. At the same time, shared challenges such as unreliable internet connectivity and difficulty managing assignment deadlines were consistently reported.

5.6. Findings Related to Perception of University Teacher of Central Universities of North East India on MOOCs' Pedagogy and Learning Design:

5.6.1. Responses and Opinions of Teachers towards MOOCs

- Out of 64 teacher respondents, 18.3% of teachers perceived MOOCs as 'Challenging.'
- 16.3% and 15.9% of teachers opined MOOCs as 'interesting' and 'helpful' for knowledge enhancement, respectively.
- 13.6% of the respondents perceived MOOCs as 'important' for further upskilling and boosting their confidence in online learning courses.
- 10.8%, 10.4% and 9.1% of the teacher respondents opined MOOCs as 'difficult' and 'encouraging' for knowledge development, and these online

learning courses ‘changed their view’ with regard to the digital learning innovation, respectively.

- On the contrary, only a few of the teachers opined MOOCs as confusing (4%) and thought-provoking (1.5%)

Qualitative Insights: Through the interview scheduled and discussion conducted by the researcher, the teacher’s respondents further commented on their perception of MOOCs. MOOCs were perceived as challenging as they increased the workload and activities of teachers beyond the regular classroom teaching-learning process, as stated by one respondent. Some teachers have opined that MOOCs are interesting due to their innovations to promote digital learning and technology integration across all levels of education, as per the NEP 2020. One respondent further commented that MOOCs will be helpful in the near future in enhancing teaching, enabling personalized learning, and ensuring equitable access to quality education even for the most disadvantaged, which meets the needs globally and locally. Additionally, another respondent further elaborated that MOOCs are an important online course for boosting confidence, promoting self-esteem, and acquiring knowledge and skills that enhance their teaching process.

On the contrary, some respondents opined that MOOCs were difficult because they required skills, digital literacy, and knowledge to properly operate technological facilities such as cameras, recorders, and uploading materials online, among other things, for the smooth delivery and offering of MOOCs. Consequently, to acquire digital literacy and technological knowledge, teachers were expected and required to train in such areas, which increases the workload and activities of the teachers. At the same time, some teachers opined that MOOCs are encouraging as they provide an opportunity to enhance their knowledge of trending digital literacy and technological knowledge, and keep them updated concerning the integration and incorporation of technologies in the modern educational system.

5.7. Findings Related to the Comparison of University Teachers' Perceptions of MOOCs' Pedagogy and Learning Design with respect to Gender, Streams of Study, and Teaching Experiences in Central Universities of North East India on:

5.7.1. Comparisons of Teachers' Perceptions of MOOCs with respect to Gender

1. Motivation for Learning:

- The computed chi-square value 4.08 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. This indicates that the result is statistically non-significant.
- Therefore, the null hypothesis (H_{011}), which states that “*there is no significant difference in the perception of motivation for learning in MOOCs between male and female teachers in central universities of North East India,*” cannot be rejected.
- Hence, the null hypothesis (H_{011}) was accepted.

2. Perceived Benefits:

- The calculated chi-square value 13.91 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance.
- Therefore, the difference in the perception of male and female teachers regarding the benefits of learning through MOOCs is statistically significant.
- Consequently, the null hypothesis (H_{012}) stating that “*there is no significant difference in the perceived benefits of learning through MOOCs between male and female teachers in central universities of North East India*” was rejected.
- Hence, it was concluded that female teachers perceived significantly greater benefits of MOOCs compared to their male counterparts.

3. Learning Challenges:

- The computed chi-square value of 11.33 is greater than the critical value of 5.991 with $df = 2$ at 0.05 level of significance.
- This outcome indicated a statistically significant difference in perceptions of learning challenges between male and female teachers.
- As a result, the null hypothesis (H_{013}), “*there is no significant difference in teachers’ perception of MOOCs’ learning challenges with respect to gender*” was rejected.
- Therefore, it can be concluded that gender plays a role in shaping teachers’ perceptions of the challenges posed by MOOCs in the central universities of North East India.

4. Learning Design:

- The computed chi-square value 7.40 is greater than the critical value of 5.991 with $df = 2$ at 0.05 level of significance.
- Hence, there is a statistically significant difference in perceptions of learning design of MOOCs based on gender.
- Consequently, the null hypothesis (H_{020}), which stated, “*There is no significant difference in the perception of MOOC learning design between male and female teachers,*” was rejected.
- The study revealed that while both male and female teachers largely agreed on the effectiveness of MOOC learning design, a relatively higher proportion of male teachers expressed disagreement or uncertainty compared to their female counterparts.

5. Development and Implementation:

- The computed chi-square value 10.11 is greater than the critical chi-square value of 5.991 with $df = 2$ at the 0.05 level of significance.
- This result indicated a statistically significant difference between male and female teachers’ perceptions.

- Thus, the null hypothesis (H_{021}), which stated that “*there is no significant difference in the perception of development and implementation of learning on MOOCs between male and female teachers in central universities of North East India,*” was rejected.
- The findings revealed that while both groups responded positively, female teachers reported a higher level of agreement, with substantially fewer instances of disagreement compared to their male counterparts.

5.7.2. Comparisons of Teachers’ Perceptions of MOOCs with respect to Streams of Study

1. Motivation for Learning:

- The computed chi-square value 4.08 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. Therefore, the result is statistically non-significant.
- Consequently, the null hypothesis (H_{014}), which states, “*there is no significant difference in the perception of motivation for learning in MOOCs between teachers across the arts and sciences streams in central universities of North East India,*” was accepted.
- The findings indicated that arts and science teachers exhibit similar levels of motivation for learning through MOOCs.

2. Perceived Benefits:

- The computed chi-square value was found to be 2.77, which is lesser than the critical table value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is considered statistically non-significant.
- Consequently, the null hypothesis (H_{015}) which states that “*there is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences teachers in central universities of North East India,*” cannot be rejected.

- This result of the study showed that no significant difference exists in the perceived benefits of learning through MOOCs between arts and sciences teachers.
- Furthermore, the findings indicated that a majority of teachers from both streams agreed on the benefits of MOOCs for teaching and learning.
- Hence, the null hypothesis (H_{015}) was accepted.

3. Learning Challenges:

- The computed chi-square value 6.03 is greater than the critical value 5.991 with $df = 2$ at the 0.05 level of significance. This indicated a statistically significant difference between the arts and sciences teachers with respect to their perception of learning challenges in MOOCs.
- Consequently, the null hypothesis (H_{016}), which stated that “*there is no significant difference in the perceived learning challenges of MOOCs between teachers across arts and science streams in central universities of North East India,*” was rejected.
- The findings of the study showed that while both groups acknowledged the existence of challenges, arts teachers had a noticeably higher proportion of undecided responses compared to science teachers, who showed stronger agreement.

4. Learning Design:

- The computed chi-square value 6.49 is greater than the critical value of 5.991 with $df = 2$ at the 0.05 level of significance. This indicates a statistically significant difference in the perceptions of learning design between arts and science teachers.
- Therefore, the null hypothesis (H_{022}), which stated that, “*There is no significant difference in the perception of learning design between arts and sciences teachers in central universities of North East India,*” was rejected.
- The findings of the study showed that while agreement was high in both streams, differences in patterns emerged, with science teachers showing a

higher proportion of agreement, whereas arts teachers reported a relatively larger share of undecided responses.

5. Development and Implementation:

- The computed chi-square value 2.06 is less than the critical chi-square value of 5.991 with $df = 2$ at the 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis (H_{023}), which states that, *“there is no significant difference in perception of MOOC development and implementation between teachers across arts and science streams in central universities of North East India,”* cannot be rejected.
- The findings showed that both streams showed relatively similar proportions of agreement, disagreement, and undecided responses.
- Hence, the null hypothesis (H_{023}) was accepted.

5.7.3. Comparisons of Teachers’ Perceptions of MOOCs with respect to Teaching Experiences

1. Motivation for Learning:

- The computed chi-square value 3.05 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis (H_{017}), which stated that *“there is no significant difference in the perception of motivation for learning in MOOCs between teachers with above ten years of teaching experience and those with below ten years,”* was accepted.
- The findings of the study showed that both groups, teachers with less than ten years of experience and those with more than ten years, highly agreed that MOOCs serve as an important source of learning motivation.

2. Perceived Benefits:

- The computed chi-square value 12.16 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance.
- This indicates a statistically significant difference in perceptions between teaching experience and benefits of learning through MOOCs.
- Consequently, the null hypothesis (H_{018}), which states that “*There is no significant difference in the perception of the benefits of learning through MOOCs between teachers with above and below ten years of teaching experience,*” was rejected.
- The findings revealed that teachers with less than ten years of experience overwhelmingly agreed on the benefits, with only a small number undecided. In contrast, teachers with more than ten years of experience showed relatively lower levels of agreement, with a greater proportion expressing disagreement or uncertainty compared to their junior counterparts.

3. Learning Challenges:

- The computed chi-square value 12.11 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance.
- This indicates a statistically significant difference between teaching experience and perceptions of MOOC-related learning challenges.
- Therefore, the null hypothesis (H_{019}), which stated, “*There is no significant difference in the perception of learning challenges through MOOCs with respect to teaching experiences,*” was rejected.
- The findings of the study revealed that teachers with less than ten years of experience showed a higher proportion of undecided responses, whereas teachers with more than ten years of experience expressed stronger agreement that MOOCs involve significant learning challenges.

4. Learning Design:

- The computed chi-square value 2.39 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis (H_{024}), which states, “*there is no significant difference in the perceived learning design of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India,*” was accepted.
- The study showed that both groups, teachers with less than ten years and those with more than ten years of teaching expressed high levels of agreement about the effectiveness of MOOC learning design, with only slight variations in the proportions of disagreement and undecided responses..

5. Development and Implementation:

- The computed chi-square value 4.44 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. This indicates no statistically significant difference.
- Therefore, the null hypothesis (H_{025}), which states “*there is no significant difference in the perception of the development and implementation of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India,*” was accepted.
- The findings of the study revealed that although both groups, teachers with less than ten years and those with more than ten years of experience expressed strong agreement on the value of MOOCs, minor differences emerge: relatively more senior teachers expressed disagreement compared to junior faculty, who were more inclined to remain undecided.

Qualitative Insights: The teachers in central university of North East India exhibited generally positive perceptions of MOOCs’ pedagogical value and learning design effectiveness across gender, streams of study, and teaching experience. The study revealed that female teachers, science teachers, and teachers below ten years of teaching experiences expressed stronger optimism and adaptability toward MOOCs.

On the contrary, it was also found that male teachers, arts teachers, and teachers having more than ten years of teaching experiences highlighted more pragmatic challenges mainly infrastructural, institutional, and sustainability-related.

The overall findings of the study revealed a consistent appreciation for MOOCs as transformative tools for higher education, tempered by contextual challenges of technology integration, learner engagement, and institutional recognition.

5.8. Discussion and Suggestions for Further Research

5.8.1. Discussions on the Major Findings of the Study

The study undertook a comprehensive analysis of Massive Open Online Courses (MOOCs) across four central universities of North East India: Mizoram University (MZU), Nagaland University (NU), North-Eastern Hill University (NEHU) and Manipur University (MU). Through a mixed-methods approach encompassing both quantitative surveys and qualitative interviews, the study explores the current status, problems and perceptions of MOOCs among stakeholders (students and teachers) within these central universities. This discussion synthesizes the empirical findings from Chapter-IV in relation to the existing literature, policy frameworks and the socio-educational context of the North Eastern region to address the study's seven research objectives.

5.8.1.1. Status of MOOCs: Awareness, Enrolment and Institutional Readiness

The findings of the study revealed that more than half (61.6%) of the surveyed students in the central universities of North East India were found to be aware of MOOCs. The results of the study showed that the students from arts (60.9%) were found to be more aware of MOOCs than sciences students (39.1%), and that female students (57.9%) were more aware of MOOCs than their male (42.1%) counterparts. Concerning the enrolment rate of students in online learning platform, the study revealed that only few students, 65 (20.3%) out of the 320 surveyed students had enrolled in MOOCs suggesting a low enrollment rate of

students in SWAYAM-MOOCs in the central universities of North East India. Among the 61.6% (197 students) who have awareness of MOOCs, 46.7% (92 students) identified teachers as the primary source of information regarding MOOCs. This highlights the pivotal role of teachers in promoting students' awareness of the importance, benefits, and potential career opportunities associated with MOOCs within the educational environment.

Concerning teachers awareness and experiences of MOOCs, the results showed that all the 64 teachers surveyed (100%) in the central universities of North East India were aware of MOOCs. However, out of the 64 teacher respondents, it was found that few teachers with 42.2% (27) had enrolled in MOOCs, suggesting that despite the widespread awareness of MOOCs, there was a low enrolment rate of teachers in SWAYAM-MOOCs in the central universities of North East India. Moreover, the findings showed that among the teacher respondents, a higher number of arts teachers (25%) enrolled in MOOCs than sciences teachers (17.2%). It was also found that a higher number of male teachers (29.7%) enrolled in MOOCs than their female (12.5%) counterparts. Furthermore, teachers with above ten years of teaching experience (32.8%) enrolled in MOOCs in higher number than their counterpart with below ten years of teaching experience (9.4%). Additionally, only few teachers with 23.4% (15 out of the 64 teacher respondents) were found to obtain their online learning completion certificate.

Despite the increased awareness of Massive Open Online Courses (MOOCs) within the institution, feedback on the status of Mizoram University as a Host Institution was assessed as fairly satisfactory, with scope for further improvement. Interview evidence indicated that the university had not offered any MOOC credit courses under SWAYAM through its faculty and relied primarily on external platforms. However, documentary evidence indicated that the minutes of the 48th meeting of the Academic Council, AC:47:4(17) recorded a resolution approving the introduction of a SWAYAM Course as a compulsory paper in place of the Interdisciplinary Minor (IMN) course across both semesters, effective from the 2025-26 Academic Session. The course was approved to carry two credits and that

postgraduate programmes across nine schools of the university had registered for SWAYAM courses during this period, as noted by the respondent.

In a comparable but less successful vein, interview data indicated that the status of SWAYAM-MOOCs at Nagaland University was perceived as unsatisfactory. In addition, participants indicated that the university had not offered any MOOC courses under SWAYAM through its own faculty and relied primarily on external platforms. Nonetheless, it is worth noting that university officials had initiated seminars and workshops to formulate long-term strategies for MOOC implementation. Despite the absence of studio facilities, dedicated infrastructure, and trained personnel or staff members, it was reported that efforts were made to familiarize students with MOOCs by facilitating their registration on the SWAYAM portal. It was also stated that students were encouraged to enroll in courses available on the SWAYAM-MOOCs portal for online learning, which had been operational for approximately four years. However, despite such encouragement, student participation remained limited.

On the contrary, interview data indicated that the status of North-Eastern Hill University was assessed as moderately satisfactory as they had established the necessary provisions for functioning as a Host Institution for SWAYAM-MOOCs since the 2022-23 academic years. These provisions included essential infrastructure such as recording studios, equipment, facilities, and support personnel for the effective implementation and operation of MOOC courses. The university was at the initial stage of providing and delivery of MOOC courses. Respondents further commented that a total of fourteen seminars, workshops, and faculty training programmes had been organized to date.

Ultimately, interview data indicated that the growth of Massive Open Online Courses (MOOCs), particularly SWAYAM-MOOCs, at Manipur University reflected a strong institutional commitment to the initiative and was assessed as highly satisfactory. Participants reported that the university functioned as a Host Institution for offering SWAYAM-MOOC courses through the Educational Multimedia Research Centre (EMMRC), one of the twenty-two media centres

established on campus by the University Grants Commission. Respondents reported that the university possessed well developed infrastructure, including a dedicated building for MOOCs, recording studios, recording gadgets, and specialized personnel such as MOOC faculty members, subject experts, presenters, editors, and production teams. Participants also indicated that faculty members from other universities collaborated in the development of MOOC materials. Moreover, it was reported that the university had actively contributed to MOOC development, having launched a total of 78 courses under the SWAYAM platform as of January 2024.

5.8.1.2. Issues with MOOCs Adoption: Infrastructure, Motivation and Institutional Support

It was evident that the measures implemented so far regarding MOOCs in central universities of North East India left much to be desired. At the time of data collection for the study, i.e, six to seven years after the UGC has laid down the *Credit Framework for Online Learning Courses through SWAYAM Regulations* (2016), it seemed to be a challenging initiative for the universities.

Although awareness of MOOCs was widely prevalent, widespread satisfactory integration is yet to be seen. The fundamental issue regarding MOOCs in these universities was this significant gap between knowing about MOOCs and its active practice or adoption. MOOCs have not yet been integrated enough to generate issues that were worth studying in depth. Additionally, there was also a significant gap among the universities in terms of MOOCs implementation, ranging from initial stage meetings to full swing adoption offering variety of courses.

There was a general lack of supporting staff at the institution level as well as training initiatives for designing, developing and providing MOOCs courses, resulting in a significant lack of teacher participation in creating these courses. Moreover, the institutions were not equipped with necessary infrastructure to run MOOC course, this was reflected by the fact that majority of the institution not offering a regular MOOC course. Further, majority of the universities were also not host institutes and therefore were not directly involved in hosting and delivery of

MOOC courses and conducting examination. This had led to problems in finding out issues relating to MOOCs implementation, as majority of the questions regarding implementation issues were met with negative responses due to lack of implementation, and the revealed issues were only from the few universities that actually implement MOOCs.

Students' enrolment in SWAYAM-MOOC was also not satisfactory, and there was a lack of proper feedback mechanism for MOOCs from the student, both of which might be due to lack of awareness about MOOCs on the students' part.

Further concern noted was time constraint. For universities with no supporting staff from affiliated colleges, it was difficult for teachers to make time for MOOCs efforts on top of their regular teaching workload. Moreover, the recording process for MOOCs courses was also a challenge, as teachers were not used to present in front of cameras for recorded courses without proper training and practice.

Moreover, evaluation system was carried out by the National Testing Agency (NTA), making it difficult to track how many students completed their courses and received certificates based on institution, as it was an online format and students from various institutions participated.

Concerns regarding academic integrity and accountability in terms of students learning and examination process were also expressed, and a push for enhanced funding to facilitate more MOOC courses was also noted.

5.8.1.3. University Students' Perceptions of Learning through MOOCs with respect to Gender and Streams of Study in Central University of North East India.

The analysis of students' perceptions of learning through MOOCs with respect to gender and streams of study in central universities of North East India revealed a high degree of consistency. Quantitative results showed no statistically significant differences in any of the five dimensions namely - motivation, perceived importance, perceived benefits, learning expectations, or perceived challenges based on either gender or streams of study. These findings were strongly corroborated by

qualitative insights from focus group discussions, where students across all groups expressed similar motivations, benefits, expectations, and challenges. The study revealed that both male and female students, as well as those from arts and sciences backgrounds, emphasized the role of teacher encouragement, self-paced learning, and personal development in motivating MOOC engagement. They uniformly recognized the value of MOOCs in enhancing academic and professional readiness, appreciated the accessibility and affordability of content. Moreover, shared challenges such as unreliable internet connectivity and difficulty managing assignment deadlines were consistently reported.

5.8.1.4. University Teachers' Perceptions of MOOCs' Pedagogy and Learning Design with respect to Gender, Streams of Study, and Teaching Experiences in Central Universities of North East India.

The teachers in central university of North East India exhibited generally positive perceptions of MOOCs' pedagogical value and learning design effectiveness across gender, streams of study, and teaching experience. The study revealed that female teachers, science teachers, and teachers below ten years of teaching experiences expressed stronger optimism and adaptability toward MOOCs. On the contrary, it was also found that male teachers, arts teachers, and teachers having more than ten years of teaching experiences highlighted more pragmatic challenges mainly infrastructural, institutional, and sustainability-related.

The qualitative data revealed a consistent theme across all four central universities. Teachers stressed the need for institutional support, resource access and consistent training to enhance MOOC implementation success. The overall findings of the study revealed a consistent appreciation for MOOCs as transformative tools for higher education, tempered by contextual challenges of technology integration, learner engagement, and institutional recognition.

5.8.2 Implication of the Study

The findings of the study have several important implications for educational policy, practice, and institutional development in higher education, particularly within the context of North East India. This includes:

1. **Strengthening Digital Infrastructure:** The moderate level of MOOC awareness and low enrolment rate among students highlights the urgent need to improve institutional infrastructure. Universities must invest in reliable internet connectivity, recording studios, and technological support systems to ensure smooth development and delivery of MOOCs.
2. **Capacity Building and Faculty Development:** Continuous professional development programs should be introduced to enhance teachers' digital literacy and pedagogical competence in using online platforms. Faculty members require ongoing training to effectively design, deliver, and assess MOOC-based learning in alignment with national and global standards.
3. **Institutional and Administrative Support:** The limited administrative ownership and dependency on third-party platforms such as SWAYAM indicate the necessity for universities to establish their own MOOC cells or dedicated e-learning centres. These bodies can coordinate local implementation, evaluation, and customization of MOOCs to meet institutional goals.
4. **Policy and Regulatory Frameworks:** Policymakers must provide clearer and more consistent guidelines for MOOC implementation, assessment, and credit transfer. Frequent changes in national regulations may discourage participation and affect the continuity of programs. A stable framework will help institutions align MOOCs with formal curricula more effectively.
5. **Inclusive and Contextualized Learning:** MOOCs should be designed to address both global standards and local educational needs. Integrating regional languages, examples, and contexts will make MOOCs more inclusive and relatable, particularly for students in remote or underserved areas of North East India.

6. **Motivation and Student Engagement:** Since students' perceptions of motivation and relevance do not significantly differ by gender or streams of study, universities should focus on enhancing the quality and interactivity of MOOCs to boost engagement and learning outcomes. Strategies such as peer discussion forums, mentorship, and localized content can increase participation.
7. **Monitoring and Evaluation:** Centralized assessments may not reflect institutional realities. Therefore, universities should develop local monitoring mechanisms to track learners' progress, gather feedback, and make evidence-based improvements to MOOC delivery.
8. **Bridging the Institutional Gap:** The example of Manipur University demonstrates how effective infrastructure and administrative commitment can lead to higher enrolment and participation. Other institutions can replicate this model by prioritizing digital transformation and collaborative partnerships.

5.8.3. Suggestions for Further Research

The study identifies several directions for future inquiry to enhance understanding and implementation of MOOCs in the region:

1. **Comparative Institutional Studies:** Further research should compare MOOC adoption and effectiveness across different universities, focusing on the factors for the successful implementation and high enrollment, with particular attention to models and examples like the Educational Multimedia Research Centre at Manipur University.
2. **Impact Assessment of MOOCs:** Further studies should rigorously examine the academic and professional impacts of MOOC participation on students and teachers, including longitudinal tracking of outcomes such as career advancement and skills acquisition.
3. **Pedagogical Innovation and Design:** Further studies could explore deeper into models of instructional design, including localized content, language diversity,

and the effectiveness of the four-quadrant approach of SWAYAM-MOOCs in engaging students from different backgrounds and disciplines.

4. **Policy and Governance Evaluation:** Given the complex policy landscape and administrative structures of MOOC implementation, studies are needed on how university-level and national policies interact, and how clearer, stable guidelines might accelerate equity in access and course recognition.
5. **Teacher Professional Development:** There is a need to further explore and investigate the professional learning courses of teachers engaging with MOOCs, the barriers to digital literacy, and effective approach for ongoing training and support.
6. **Technological Barriers and Solutions:** With internet reliability and technological resource gaps being key challenges, future research should identify cost-effective infrastructure improvements and scalable digital solutions suitable for the North East Indian context.
7. **Student Engagement and Retention:** More studies should focus on understanding and mitigating factors contributing to low student enrollment and retention in MOOCs, including social, cultural, and institutional influences.
8. **Feedback and Assessment Mechanisms:** Building efficient feedback systems and decentralized evaluation frameworks can be a pathway for research to ensure student success and course quality.

Conclusion

From the major findings of both quantitative and qualitative data, the current research was limited by sample size and the reliance on self-reported data, which may restrict the relevance of findings. Institutional differences in infrastructure, support, and implementation phases warrant more granular comparative case studies. The rapidly evolving policy framework also means that ongoing adjustment and monitoring are critical.

MOOC development and implementation in central universities of North East India are at a formative stage. Institutional support, policy clarity, infrastructural investment, and ongoing research are essential to harness MOOCs' transformative potential for higher education in the region.

APPENDIX – A

Interview Schedule for Teachers

Part-A: Personal Information

1. Gender: (a) Male____ (b)Female____(c)Third Gender____
2. Name of Institution: _____
3. Name of State: _____
4. Years of teaching experience: (a) Below 10 years ____ (b) Above 10 years____
5. Streams of study: (a) Arts____ (b) Science____
6. Name of Department: _____

Part-B: Status of MOOCs

1. Does your institution offer MOOC courses to students? Is it a Host Institute?
2. What educational MOOCs platform does your institution provide?
3. How many courses run at present?
4. If your institution offers MOOCs, what has been the student enrolment pattern?
5. If your institution is a host institution, what challenges have you faced in hosting and delivering MOOCs?
6. Is your institution equipped with the necessary infrastructure to run MOOCs?
7. How would you assess the infrastructure available at your institution for developing MOOCs?
8. What technological resources (recording studios, cameras, editing software, servers, etc) are available or lacking?
9. What has been your observation regarding student completion rates in MOOCs?
10. Do you face time constraints in developing or delivering MOOCs while managing your regular teaching responsibilities?
11. Have there been any issues with the result declaration processing or issuing of certificates?

12. Does your institution have dedicated supporting staff (instructional designers, multimedia experts, technical personnel) for developing and providing MOOCs?
13. What level of institutional commitment – administrative, financial, or policy support exists for MOOC development?
14. What challenges do you identify in implementing MOOCs in your institution?
15. What are the plans and programs, or your vision for the future of MOOCs in your institution?

APPENDIX – B

Questionnaire on Issues – Design, Development and Implementation of MOOCs

Dear Sir/Madam,

A research study entitled, “**Massive Open Online Courses in Central Universities of North East India: Status, Problems, and Perceptions of Stakeholders**”, is going to be conducted by the Department of Education, Mizoram University, Aizawl, by me under the supervision of Prof. Lokanath Mishra.

The following questions contain some statements relating to the issues in connection with the design, development, and implementation of Massive Open Online Courses in the Central Universities of North East India. Please, go through each statement and indicate how each item is related to you against the statement with the given option “Yes” or “No”. The responses you give will be kept strictly confidential and used for research only.

Thanking You.

Sincerely Yours,

Lalchhanhimi

Research Scholar

Department of Education

Mizoram University, Aizawl, Mizoram

Personal Information

1. Gender: (a) Male____ (b) Female____(c) Third Gender____
2. Name of Institution: _____
3. Name of State: _____
4. Years of teaching experience: (a) Below 10 years ____ (b) Above 10 years____
5. Streams of study: (a) Arts____ (b) Science____(c) Others____
6. Name of Department: _____

The following statements assess issues influencing the designing, development, and implementation of Massive Open Online Courses (MOOCs). Respondents are requested to indicate their responses (Yes/No) to each statement based on their institutional experience.

S/No	Statements	YES	NO
Issues with the Designing of MOOCs:			
1.	Are you aware of Massive Open Online Course?		
2.	Have you prepared any MOOC courses?		
3.	Does your institution have a supporting staff for developing and providing MOOCs?		
4.	Are you trained in designing and developing MOOCs?		
Issues with the Development of MOOCs:			
5.	Does your institution offer a regular MOOC course?		
6.	Is your institution equipped with the necessary infrastructure to run MOOCs?		
7.	Do you think the MOOC course provided by your institution is developed based on the four quadrants, i.e., e-tutorial, e-content, discussion forum, and assessment?		
8.	Does your institution provide any skill-based courses on SWAYAM-MOOC?		
9.	Have you encountered any issues with Nodal Institutions when uploading MOOCs?		
10.	Are there students enrolled in SWAYAM-MOOCs provided by your institution?		

11.	Is there any appropriate feedback mechanism for MOOCs from the students?		
Issues with the Implementation of MOOCs:			
12.	Is your institute a host institute for offering MOOC courses and conducting examinations?		
13.	Is there any student who graduated from the MOOC course provided by your institution?		
14.	Are there any issues related to time when providing MOOCs?		
15.	Is your institution experiencing any issues with the declaration of results for the MOOC course?		
16.	Has your institution issued credits and certificates to students who completed MOOC courses?		
17.	Do you find problems related to the availability of resources (e.g., laptops, smartphones, audio recorders, etc)?		
18.	Do you encounter issues related to providing good internet facilities for offering MOOCs?		
19.	Has your institution encountered difficulties uploading materials such as videos, audio, and assignments for the MOOC course?		
20.	Do you encounter problems with the accessibility of course materials in MOOCs after completing classes?		
21.	Is the content coverage of the MOOC course in line with the guidelines of NEP 2020?		
22.	Is there a problem related to the medium of instruction of MOOCs?		
23.	Do you encounter issues with the evaluation procedure for students' overall performance on MOOCs?		
24.	Do you find it challenging to keep track of students' assignments and participation in MOOCs?		

APPENDIX - C
Questionnaire for Students' Perceptions on MOOCs

Dear Participant,

I am Lalchhanhimi, a Ph.D. scholar at the Department of Education, Mizoram University, Aizawl, Mizoram. I am working on a research study entitled “Massive Open Online Courses in Central Universities of North East India: Status, Problems, and Perceptions of Stakeholders” under the supervision of Prof. Lokanath Mishra.

The following questions contain some statements relating to perceptions of Massive Open Online Courses in the Central Universities of North East India. Please go through each statement and indicate how each item is related to you against the statement with the given option put forward. There is no right or wrong answer; instead, please choose freely what appeals to you. Your responses will be kept strictly confidential and used for research only. Before going to Part B, kindly fill in the personal information of Part A.

Thanking You.

Sincerely Yours,

Lalchhanhimi
Research Scholar
Department of Education
Mizoram University, Aizawl, Mizoram

Part-A: Personal Information

1. Gender: (a) Male ____ (b) Female: ____ (c) Third gender: ____
2. Streams of study: (a) Art ____ (b) Science ____
3. Name of Department: _____
4. Name of Institution: _____
5. Name of State: _____
6. Name of the Course: _____

Part-B:

1. Do you know Massive Open Online Courses (MOOCs)? YES ____ NO ____
2. Have you ever enrolled in any MOOC platform? YES ____ NO ____
3. What is the source through which you came to know about SWAYAM-MOOCs?

- Teacher
- Family
- Friends
- Internet
- Newspaper
- University Administration
- Never heard before
- Other

4. From the following list of educational platforms, please select all the platforms you are aware of and have used for learning.

Educational Platforms	Aware of
Udemy	
SWAYAM	
Udacity	
OpenLearn	
Coursera	
FutureLearn	
edX	
NPTEL	

5. Which of the following words best describes your thoughts on MOOCs?
(Tick all that apply)

- ☐ Interesting
- ☐ Scary
- ☐ Off-putting
- ☐ Confusing
- ☐ Helpful
- ☐ Encouraging
- ☐ Important
- ☐ Boring
- ☐ Irrelevant
- ☐ Difficult
- ☐ Stimulating
- ☐ Challenging
- ☐ Changed my view

Part-C:

To what extent do you agree or disagree with the following statements regarding the motivation, importance, benefits, expectations, and challenges of Massive Open Online Courses (MOOCs)?

S/No	Statements	Agree	Disagree	Undecided
Motivation				
1.	To gain confidence or self-esteem.			
2.	For personal development.			
3.	As a replacement for college/university education.			
4.	To improve employment prospects.			
5.	To assist my formal studies.			
6.	To gain qualifications or credit for further studies.			
7.	I am motivated by my teacher/peer members.			
Importance				
8.	It enables me to improve my study skills.			
9.	It enables me to access the material at any time.			
10.	It provides opportunities for my work to be assessed.			
11.	It provides opportunities for interaction with other learners.			
12.	The course platform is easy to use.			
13.	It further boosts classroom learning.			
Benefits				
14.	It will be helpful to learn through video lectures.			
15.	I will be able to get a certificate after			

	completing the course.			
16.	It enables me to try university-level content for free.			
17.	The course is provided by a prestigious university.			
18.	Transcripts are being provided for videos and slides.			
19.	The course is of high quality.			
20.	A student can learn according to his needs and pace.			
Expectations				
21.	It will be helpful for the modern competitive job market.			
22.	It will be helpful for intellectual curiosity.			
23.	MOOCs will be helpful for clarification of misconceptions and doubts at your own pace outside of your regular classroom.			
24.	It will be helpful for greater enrollment and retention in higher education.			
25.	It will be helpful for working and poor students.			
26.	MOOCs will allow us to keep pace with changes in technology-enhanced learning and innovative pedagogies.			
27.	MOOCs provide an opportunity to learn from global teachers with global peers.			
28.	It will be helpful in the preparation for further studies.			
29.	It helps in supplementing my existing studies.			
Challenges				

30.	Discussion forums are overwhelming.			
31.	The assessment procedure is too challenging.			
32.	Insufficient contact with course instructors/tutors.			
33.	Unreliable internet connectivity will be a significant issue when providing practical MOOC courses.			
34.	The level of the course seems to be too advanced.			
35.	Difficulty in understanding the instructor's accent.			
36.	Language or communication barriers pose one of the significant issues in MOOCs.			
37.	The assessment process and declaration of results are not completed in time.			

APPENDIX – D

Questionnaire for Teachers' Perceptions on MOOCs

Dear Sir/Madam,

A research study entitled, “**Massive Open Online Courses in Central Universities of North East India: Status, Problems, and Perceptions of Stakeholders**”, is going to be conducted by the Department of Education, Mizoram University, Aizawl, by me under the supervision of Prof. Lokanath Mishra.

The following questions contain some statements relating to perceptions of Massive Open Online Courses in the Central Universities of North East India. Please go through each statement and indicate how each item is related to you against the statement with the given option put forward. There is no right or wrong answer rather, please choose freely what appeals to you. The responses you give will be kept strictly confidential and used for research only.

Thanking You.

Sincerely Yours,

Lalchhanhimi

Research Scholar

Department of Education

Mizoram University, Aizawl, Mizoram

Part-A: Personal Information

1. Gender: (a) Male____ (b)Female____(c)Third Gender____
2. Name of Institution: _____
3. Name of State: _____
4. Years of teaching experience: (a) Below 10 years ____ (b) Above 10 years____
5. Streams of study: (a) Arts____ (b) Science____
6. Name of Department: _____

Part-B: Teachers' Awareness

1. Are you aware of MOOCs? YES____ NO____
2. Have you enrolled in any MOOC courses? YES____ NO____
3. Do you have a MOOC course certificate? YES____ NO____
4. Are you well aware of its benefits? YES____ NO____
5. Which of the following words best describes your thoughts on MOOCs?
(Tick all that apply)

- ☐ Interesting
- ☐ Scar
- ☐ Off-putting
- ☐ Confusing
- ☐ Helpful
- ☐ Encouraging
- ☐ Important
- ☐ Boring
- ☐ Irrelevant
- ☐ Difficult
- ☐ Stimulating
- ☐ Challenging
- ☐ Changed my view

6. From the following list of educational platforms, please select all the platforms you are aware of, as well as have used for learning.

Educational Platforms	Aware of	Have used
Udemy		
SWAYAM		
Udacity		
OpenLearn		
Coursera		
FutureLearn		
edX		
NPTEL		

Part – C:

1. To what extent do you agree or disagree with the following statements regarding the pedagogy (motivation, benefits, and challenges) of Massive Open Online Courses (MOOCs)?

S/No.	Statements	Agree	Disagree	Undecided
Motivation:				
1.	MOOC course is helpful for present needs.			
2.	It is helpful for a future career.			
3.	MOOCs are helpful for intellectual curiosity.			
Benefits:				
4.	MOOCs allow us to keep pace with changes in technology-enhanced learning and innovative pedagogies.			
5.	The worldwide reach of MOOCs allows us to showcase the quality of our teaching and learning to a large audience.			
6.	MOOCs are an ideal channel for both disseminating research and generating			

	research data.			
7.	MOOCs are helpful for working teachers.			
8.	MOOCs elevated appreciation for the profession of teaching.			
9.	MOOCs provide an opportunity to learn from global teachers with global peers.			
10.	MOOCs affected positively my perspective on teaching.			
11.	I learned useful skills and information for my teaching.			
12.	I believe that MOOCs cultivate collaboration among teachers.			
13.	I believe that MOOCs enhanced opportunities and new challenges for self-directed and autonomous learning.			
Challenges:				
14.	MOOCs cannot provide personalized courseware and attention from a tutor.			
15.	Learners with disabilities and a poor internet connection cannot use MOOCs.			
16.	Language can be a barrier when offering MOOCs.			
17.	It is difficult to keep track of students' assignments and involvement.			
18.	There are inadequate infrastructures in universities for offering MOOCs.			
19.	There can be a student dropout rate before course completion.			
20.	MOOCs cannot be used as a credit-earning course at universities.			

2. To what extent do you agree or disagree with the following statements regarding the learning design, development, and implementation of Massive Open Online Courses (MOOCs)?

S/No.	Statements	Agree	Disagree	Undecided
Learning Design:				
1.	The online course promoted learning by creating a learning community among peers.			
2.	MOOC courses promoted learning based on learning objectives and learning outcomes.			
3.	MOOC courses promoted collaborative learning of the participants.			
4.	The interface of the SWAYAM-MOOCs like icons, etc. is designed to accommodate easy access by anyone.			
5.	Peer collaboration in MOOCs strengthened my design ability to use new ICT-based methods in my teaching.			
Development and Implementation:				
6.	SWAYAM-MOOCs platform is appropriate for achieving the teaching-learning goals.			
7.	MOOCs provide an environment that promotes learner-teacher interaction.			
8.	The instructions and terms of the SWAYAM-MOOCs are clear enough.			
9.	Co-operating with peers in MOOCs strengthened my self-confidence as a teacher.			

10.	An appropriate information guide is provided for the entire structure of MOOCs.			
11.	SWAYAM-MOOCs platform also promotes interaction among the learners.			
12.	MOOCs provide unique and quality content for courses.			
13.	MOOCs provide e-books and web resources.			
14.	The assessment process in MOOCs is authentic and fair enough.			
15.	There is no cultural inertia while offering an online course.			
16.	Teachers should be properly trained for handling MOOCs in SWAYAM.			
17.	Learners can easily download the course material.			
18.	Learners can easily participate in the discussion forum and evaluation as well.			
19.	Sharing ideas with other colleagues helped me in my professional work.			

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MASSIVE OPEN ONLINE COURSES (MOOCs) AT UNIVERSITY LEVEL**Lalchhanhimi**

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Loknath Mishra

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Abstract: Massive Open Online Courses (MOOCs) has become one of the most popular trends in the higher education level in recent years and enrolment has increased tremendously not only in India but globally. The present study aims to find out the perceptions of post-graduate students of Mizoram University towards MOOCs and examine the benefits and challenges of learning through MOOCs. The present study is imperative to find out the students' awareness of MOOCs and to find out the necessary measures to be taken for the implementation of MOOCs in Mizoram University for optimum learning outcomes. The study is quantitative in which a descriptive survey method was employed. Using a simple random sampling technique, a total of 109 students responded to the questionnaire through online Google forms. The findings of the study revealed that the majority of the students were unaware of the various forms of MOOCs. It was also found that the majority of the respondents were in favor and support of MOOCs as beneficial for students as it enables learners to access education anywhere, at any time. Contrary to the previous finding, an unreliable internet connection was found to be one of the major possible challenges as perceived by the students towards learning through MOOCs.

Keywords: MOOCs, Perceptions, Benefits, Challenges

Introduction:

Education is an important human activity that was born with the birth of the human race which will continue as long as the human race lives. It is crucial to building the nation as education plays a vital role in the growth and development of society (Lalchhanhimi, 2021). It is an important tool to achieve the goals of life in the modern world (Sharma, 2018). An intervention of scientific technologies and technology globalization is only through education. However, such new development of technologies results in astounding growth and dramatic changes in the traditional education system where knowledge was imparted within the four walls only (Lalchhanhimi, 2021). So, with the rapid growth of new technologies and the emergence of web 2.0 which provided different ways for delivering information, MOOCs came

MOOC refers to an online course with an option of free and open registration of publicly shared curriculum and open-ended outcomes (McAuley et al., 2010). A MOOC is an online course that is open to anyone without any restrictions which imply free of charges and no limitation to attendance, with a structured set of learning goals in an area of study which runs over a specific period. MOOCs also provide some course material and self-assessment tools for independent studying with interactive possibilities between peers or between the learners and instructors to facilitate community learning (Singh, 2016).

Massive Open Online Course is one of the most widely used and popular courses in the present for offering online learning courses around the world, from the secondary level of education to the higher education level. The term MOOCs was first coined by Dave Cormier in 2008 to refer to a course entitled 'connectivism and connectivity knowledge', a peer learning model which was developed by George Siemens and Stephen Downes (Latha, 2019). By 2011, more educational videos were developed and released through online platforms with free web resources by experts and professors from Stanford University. More than 56 million students from all over the world are registered for MOOC courses which are offered by more than 700 universities by 2016 (Chauhan & Goel, 2017). The Government of India has also introduced and developed various projects for offering Massive Open Online Courses to satisfy the educational needs and cope with the enormous growth of enrolment in the country (Lalchhanhimi, 2021).

India is dominating the global growth of enrolment after the US. The popular platforms used in India for providing online education are NPTEL, mooKIT, IITBX and the most recent initiative started by the Government of India is SWAYAM, intending to serve at a large scale and cope with the needs of the learners (Chauhan & Goel, 2017; Lalchhanhimi, 2021).

Some studies have shown that MOOCs are one of the most popular and prominent trends in higher education (Baturay, 2015) and many scholars had undergone studies related to the theoretical and technical background of MOOCs platforms as well as their features around the world. Indian scholars have also studied and compared the MOOC platform used for offering courses in India (Chauhan & Goel, 2017). But no such studies have been conducted on the students of Mizoram University, their awareness, and perceptions towards MOOCs. Thus, there is a need to provide awareness about massive open online courses among the students and to find out the perceptions of post-graduate students of Mizoram University towards MOOC and the benefits along with the challenges of implementing MOOC courses. So, the researcher is interested in doing this study with the following objectives.

Objectives of the study:

1. To find out the perceptions of post-graduate students of Mizoram University towards learning through MOOCs.
2. To examine the benefits and challenges of learning through MOOCs.

Literature Review:

Studies associated with MOOCs have been conducted by various researchers. Regardless of their recent origin, MOOCs have gained popularity since then. Likewise, several studies concerning the study of students' perception of MOOCs have been undertaken earlier and those found relevant to the topic under study may be presented as under:

Aharony & Bar-Ilan (2016) had undergone a study on, "Students' perceptions on MOOCs: An explanatory study". The study was both quantitative and qualitative techniques involving 102 students. The findings of the study revealed that with quantitative analysis, perceived usefulness (PU) and the perceived ease of use (PEOU) had a crucial impact on the intention and interest to enroll in a MOOC. The qualitative analysis of the study also revealed that there are diversified needs and expectations among the students, and concluded that MOOCs platforms should be provided with multiple options to cater to the needs and expectations, thus, improving the current MOOC platforms.

Majid et al. (2019) conducted a study on, "Postgraduate students' perception of Massive Open Online Courses (MOOCs) in enhancing their learning experience". The findings of the study concluded that MOOCs, due to their user-friendliness, accessibility, and sharing opportunities, provide an advanced learning platform to adult learners and that such several attributes help to maximize their learning potential. The study also showed that the postgraduate students were in favor of the learning platforms as MOOCs had provided the learners with opportunities that laid stress on meaningful and hands-on learning according to their learning needs as well, thus addressing their learning process and optimum outcomes.

Sukhbaatar et al (2018) had studied "Students' perception and experience of Massive Open Online Courses in Mongolia". The findings of the study showed that the majority of the students have doubts about the quality of MOOCs and were unfamiliar with the online learning environment, which leads to low enrolment in MOOCs. It was also found that only about 37% of the respondents had prior knowledge and experience of using MOOCs. However, the results of the study showed that there is a positive influence of MOOCs on students' studies and that majority of the respondents were found to be willing to take up open online courses if were offered by the university.

Methodology:

The present study is a descriptive survey study was conducted to find out the perceptions of post-graduate students of Mizoram University towards Massive Open Online Courses (MOOCs). For the present

investigation, the population comprises all the post-graduate students of Mizoram University. The study comprises a simple random selection of students of Mizoram University. The total number of respondents who participated in this study was 109 post-graduate students from different departments of different schools of study within Mizoram University. An online self-made survey questionnaire was utilized for the collection of data by utilizing Google forms. The researcher developed a questionnaire with (24) items based on related literature and previous studies. Five-level Likert item (strongly disagree,

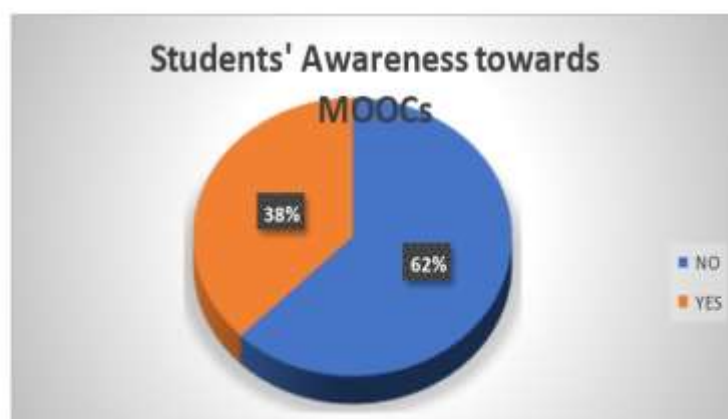


Figure-1:

disagree, neither agree nor disagree, agree, strongly agree) was adopted in the questionnaire of this study. The questionnaire was validated by a group of faculty members of the department of education, Mizoram University. Their comments were incorporated for preparing the final version of the questionnaire. The reliability of the questionnaire was checked by distributing the questionnaire to (30) postgraduate students outside of the sample of the study. After two weeks, the questionnaire was distributed again. The Pearson correlation coefficient was (.72), which is highly reliable. The connection of the semi-organized poll was sent through messages, WhatsApp, and other social media to the students who have connected with the contacts of the investigator. Accordingly, the link was sent to the students apart from the primary purpose of contact. Part-A of the survey incorporates sex, stream of education, area of residence, and course. Part-B of the survey questionnaire was to gauge the perception of the students on MOOCs.

Findings:

This section of the present study comprises the objective-wise findings after percentage analysis.

Findings related to objective one: To find out the perceptions of post-graduate students of Mizoram University towards learning through MOOCs.

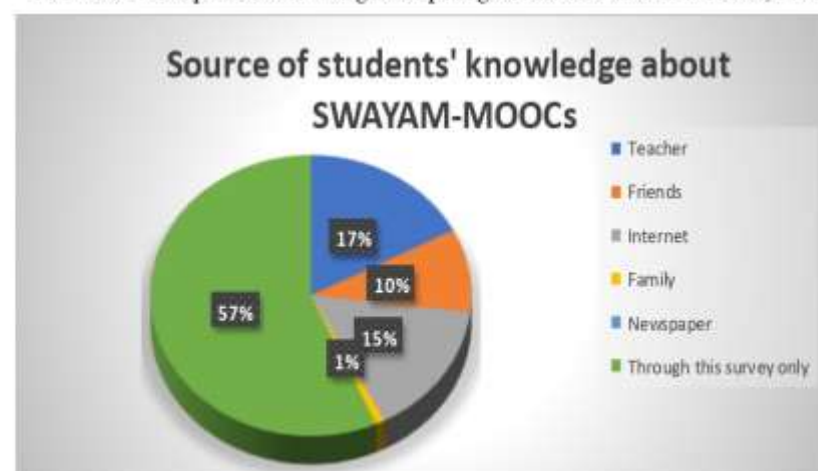
The researchers conducted a survey study in which percentage analysis had been done to reveal their opinions on SWAYAM-MOOCs. When asked about the respondents' awareness of SWAYAM-MOOCs, the findings of the study revealed that the majority of the respondents, 62% were unaware of the SWAYAM-MOOCs platform, and also with 57%, the findings showed that the majority of the respondents came to know about MOOCs through the survey conducted only, as shown in Figure 1 and Figure 2 respectively.

Different educational platforms have been developed and implemented to offer online courses not only in India but globally and the researcher had listed some of the most popular platforms to find out the students' awareness and the platforms they have used for learning. The educational platforms that had been

listed in the questionnaire were SWAYAM, Udemy, Udacity, Open Learn, Coursera, FutureLearn, IIT Bombay X, edX, and NPTEL. With 44%, the findings showed that the majority of the post-graduate students were unaware of all the educational platforms listed in the questions for the present study. The findings of the study also revealed that the majority of the students, 72% have not used any of the educational platforms mentioned.

Figure-2:

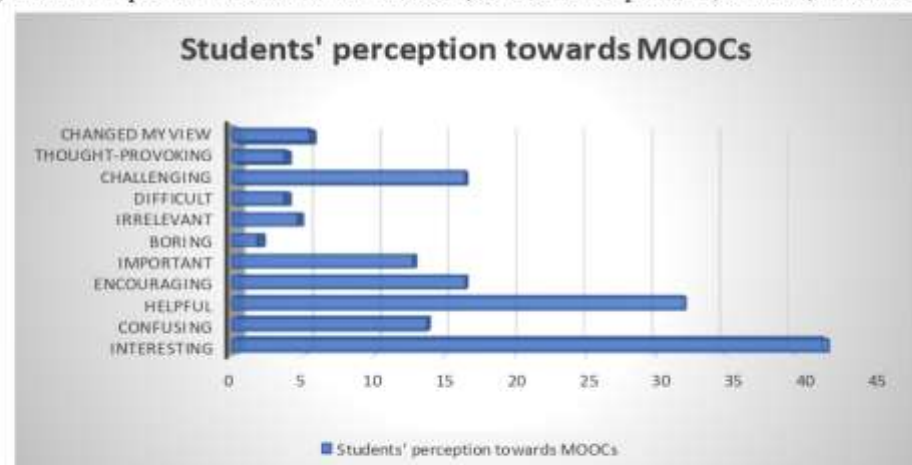
To find out the opinions and thoughts of post-graduate students on MOOCs, different



phrases or words were listed in the questionnaire by the researcher where students were encouraged to respond and give their genuine thoughts on MOOCs. Figure-3 represents the students' perception of MOOCs and from the responses of students, 42% were opined to be interested in MOOCs and 32% thought of MOOCs as helpful which is both positive results. With 17%, the respondents opined and thought that MOOC is an encouraging and challenging online course respectively which can also be considered as a positive attitude of post-graduate students towards Massive Open Online Course.

Figure-3:

Though there were positive attitudes towards MOOCs, some of the respondents, with 4%, considered



that MOOCs seemed to be irrelevant, difficult, and thought-provoking respectively. The findings of the study also revealed that only about 2% of the respondents were uninterested in MOOCs. On the contrary, about 6% responded that MOOCs had changed their views and opinions toward online courses.

Findings related to objective two: To examine the benefits and challenges of learning through MOOCs.

The researcher approached the respondents with a different set of questionnaires of probable benefits and issues on MOOCs to find out their perceptions of the same. There were 24 items in the statement where items number 1 to 17 were statements related to the benefits of learning through MOOCs and items number 18 to 24 contains statements related to the issues or challenges of MOOCs. The students' perceived benefits of MOOCs are registered and shown in Table no. 1 and the perceived probable challenges of MOOCs are shown in Table no. 2.

Table No. 1:
Students' perception of the benefits of learning through MOOCs
(Data presented in percentages)

	Statements	SA				
		SA	A	U	D	SD
Students' perception towards the Benefits of learning through MOOCs	MOOC is helpful to gain qualifications or for further studies.	13.8	25.7	45	10.1	5.5
	MOOC is useful for personal development.	11.9	33	33.9	12.8	8.3
	It is helpful to assist my formal studies.	10.1	32.1	34.9	15.6	7.3
	It enables the learner to learn through video lectures.	21.1	32.1	25.7	13.8	7.3
	It enables the learner to access the material anytime.					
	It enables the learner to improve their study skills.	17.4	22.9	35.8	11.9	11.9
	It enables the learner to study the course online.					
	It enables the learner to try university-level content for free.	13.8	27.5	32.1	16.5	10.1
	It provides opportunities for interaction with other learners all over the world.	26.6	22.9	25.7	14.7	10.1
	A student can learn according to his needs and pace through MOOCs.	11.9	25.7	37.6	16.5	8.3
	It is helpful for intellectual curiosity.					
	It is helpful to learn confusing material at your own pace outside of your regular classroom.	11.9	31.2	35.8	11.9	9.2
	It is helpful for greater enrolment and retention in higher education.	11.9	30.3	39.4	11.9	6.4
	It is helpful for working and poor students as one can learn according to his convenience.	15.6	34.9	29.4	11.9	8.3
	It provides opportunities to learn from global teachers with global peers.	14.7	27.5	34.9	14.7	8.3
	It helps and prepares the learners in pursuing further studies.	8.3	23.9	47.7	10.1	10.1
	It helps in supplementing learners' existing studies.	15.6	24.8	35.8	13.8	10.1
		14.7	30.3	32.1	13.8	9.2
		9.2	31.2	36.7	14.7	8.3
		9.2	35.8	33.9	12.8	8.3

**Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), Strongly Disagree (SD)*

The findings of the present study in regards to the students' perceived benefits of MOOCs from Table No. 1 showed that the majority of the respondents were in favor and support of MOOCs as beneficial for students as it enables learners to access education anywhere, at any time.

When the respondents were asked to respond to their genuine thought on the benefits of MOOCs, as shown in Table No. 1, the study indicated that about 53.2% were in support of the course as MOOCs enable the learner to learn through video lectures. 50.5% of the respondent, thought MOOCs to be helpful for intellectual curiosity, and 45% supported MOOCs as beneficial as it provides an opportunity to learn from global teachers with global peers and also help in supplementing learners' existing studies. About 42.2% were in favor of MOOCs as a student can learn according to his needs and pace and helpful to learn confusing material at one's own pace outside of the regular classroom. The findings of the study also revealed that with 41.3% and 40.3% respectively, another benefit of MOOCs was that it enables the learner to improve one's study skills and enable the learner to access the material at any time.

As much as MOOCs were beneficial for providing access to equal opportunity to education for every learner, problems related to the implementation and development of the course content needed to be understudied to take necessary measures for the optimum learning outcomes and successful development of the online course. The respondent's thoughts on the probable challenges of MOOCs were registered and are presented in Table No.2.

Table No.2:
Students' perception of the challenges of learning through MOOCs
(Data represented in percentages)

Students' perceptions of the challenges of learning through MOOCs	Statements	SA	A	U	D	SD
	I think the assessment seems to be too challenging.	5.5	27.5	46.8	14.7	5.5
	An unreliable internet connectivity may affect the learning outcomes.	29.4	25.7	23.9	11	10.1
	The assessment procedure might be insufficient.	8.3	30.3	41.3	13.8	6.4
	There can be difficulty in understanding the accent of the instructor.	20.2	28.4	26.6	14.7	10.1
	The level of the course seems to be too advanced.	6.4	17.4	54.1	20.2	1.8
	The discussion forum seems to be overwhelming.	5.5	15.6	58.7	13.8	6.4
	There is a lack of peer assessment.	9.2	16.5	55	14.7	4.6

**Strongly Agree (SA), Agree (A), Undecided (U), Disagree (D), Strongly Disagree (SD)*

Table No.2 reflects the challenges pertaining to the successful implementation of MOOCs at Mizoram University. Effective learning outcome through MOOCs necessitates reliable internet connection, which is evident in the present study where the responses of the majority of the students (55.1%) attributed unreliable internet connection as restricting the successful implementation of MOOCs. With regards to the effective teaching-learning process, communication plays a crucial role in the medium of instruction and languages used for disseminating knowledge among the learners. So, 48.6% opined that there can be difficulty in understanding the accent of the instructor, and may lead to miscommunication between the

teachers and students which is another possible challenge in learning through MOOCs. The respondents with 38.6% and 33% respectively, were found to be opined that the assessment procedure might be too challenging as well as insufficient. About 25.7% of the respondents agreed that there seemed to be a lack of peer assessment in MOOCs. The findings of the study also revealed that about 23.8% of students were of the view that the level of the course content seems to be too advanced which was indicated as one of the possible challenges of learning through MOOCs.

Findings and Discussion:

The findings of the present study showed that 62%, the majority of the respondents were unaware of the SWAYAM-MOOCs platform. Several studies regarding the awareness level of students towards MOOCs had been conducted by different researchers and some of the findings reviewed were similar to that of the present study. It was found that a study conducted in Mongolia (Sukhbaatar et al., 2018) revealed that the majority of the respondents, 53% were unaware of the SWAYAM-MOOCs platform. Also, a study conducted at Assam University, Silchar, and Tripura University, Agartala (Purkayastha & Sinha, 2021) was found to be similar to that of the findings of the present study where the majority of the respondents (69.4%) were unaware of the SWAYAM-MOOCs. Thus, this high rate of unawareness of MOOCs platforms indicates that the MOOC providers need to take initiative measures to provide awareness among the young generation from the earliest stage possible.

In contrast to this, studies conducted on the perceptions of MOOCs among 10 reputed State Universities in India with 400 respondents (Kundu & Bej, 2019) reported that the awareness of MOOCs among the respondents was quite high and that most of the Indian State universities students were well exposed to MOOC courses as compared to the students of Mizoram University.

The findings of the present study also revealed that students with 28% had previous experiences with educational platforms and that 11.9% of respondents had enrolled in the SWAYAM-MOOCs. This finding was quite similar to the past study conducted at the National University of Mongolia (Sukhbaatar et al., 2018) where the study showed that one-third of the students, 37% had previous experiences of using MOOCs which was rather high in comparison to our findings.

With 42%, the respondents were opined to be interested in MOOCs and it was found that the survey conducted was the main source of knowledge about MOOCs which is considered a positive result of the present study. Similarly, in a study conducted among the postgraduate students from different colleges and campuses under the University of Calcutta (Pramanik, 2018), the findings showed that the majority of the respondents were interested in digital modes of education like SWAYAM-MOOCs. Also, a study conducted at Assam University and Tripura University (Purkayastha & Sinha, 2021) revealed that 89% of respondents were found to be interested in doing MOOCs. However, the present findings were quite low as compared to both previous studies.

The findings of the present study in regards to the students' perceived benefits of MOOCs showed that the majority of the respondents were in favor and support of MOOCs as beneficial for students as it enables learners to access education anywhere, at any time. With 50.5%, the respondent thought MOOCs to be helpful for intellectual curiosity and that it provides an opportunity to learn from global teachers with global peers and also help in supplementing learners' existing studies. The present study also showed that students can learn according to their needs and pace. With 41.3% and 40.3% respectively, the study showed that another benefit of MOOCs was that it enables the learner to improve one's study skills and enable the learner to access the material at any time. Similar to the present findings, in the previous study conducted in Mongolia (Sukhbaatar et al., 2018), 18.7% of the respondents were found to be using MOOCs to improve their knowledge which tends to have a positive influence on the students' study. A study conducted among Indian State University students and teachers (Kundu & Bej, 2019) also showed that a total of 324

respondents had agreed that MOOCs are helpful for future careers and that many participants had enrolled in MOOCs for enhancing their future employability.

Effective learning outcome through MOOCs necessitates reliable internet connection, which is evident in the present study where the responses of the majority of the students (55.1%) attributed unreliable internet connection as restricting the successful implementation of MOOCs. Such a challenge and issues regarding the successful implementation of MOOCs were found similar to the findings of past research (Majid et al., 2019; Kundu & Bej, 2019). With regards to the effective teaching-learning process, communication plays a crucial role in the medium of instruction and languages used for disseminating knowledge among the learners. So, 48.6% opined that there can be difficulty in understanding the accent of the instructor, and may lead to miscommunication between the teachers and students which is another possible challenge in learning through MOOCs. Similarly, 68% of respondents strongly agree that language and cultural diversity as a major challenges for the extensive implementation of MOOCs (Pramanik, 2018). The present study also revealed that about 23.8% of students were of the view that the level of the course content seems to be too advanced which was indicated as one of the possible challenges of learning through MOOCs. In addition to this, lack of proper guidance and orientation on MOOCs (Purkayastha & Sinha, 2021), lack of personal computer, lack of power supply with poor internet connectivity, and inadequate infrastructure (Kundu & Bej, 2019) were found to be the major factor posing a challenge among students towards learning through MOOCs.

Conclusion:

The majority of the respondents in this study were students without any prior knowledge of the concept of MOOCs. While considering the importance and needs of the present study, however, maximum reliability and the desired outcome could be drawn had the study been conducted among students who had familiarity and experiences in the SWAYAM-MOOCs platform. In addition, since this platform has provided an important learning opportunity for all regardless of diverse backgrounds, it is recommended that awareness about SWAYAM-MOOCs must be provided from the undergraduate level or at the earliest stage possible while emphasizing the role of the higher authorities to take initiatives and their responsibility to propagate MOOCs to the maximum reach. This will give assurance for the awareness among students and call for maximum participation and utilization, and the opportunity it provides for all, besides for the progression and overall, for enriching quality education.

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Educating Youth Through Massive Open Online Courses: A Conceptual Analysis of SWAYAM Platform

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Abstract

Rapid technological advancements have revolutionized educational delivery, making learning more accessible and flexible than ever before. Among the most revolutionary advancements in education are Massive Open Online Courses (MOOCs), which is a web-based platforms that provide open access to high-quality educational resources for learners worldwide. In India, the government's SWAYAM initiative embodies a significant effort aiming at making education more accessible through MOOCs, particularly targeting the nation's youth. Nevertheless, there remain ongoing inquiries about how effectively these platforms convert theoretical potential into practical learning outcomes. This paper develops an integrated conceptual framework grounded in constructivism, connectivism, self-regulated learning theory, and the community of inquiry model to examine SWAYAM-MOOCs' potential and limitations in educating Indian youth. Drawing on existing literature and the specific context of education in India, the authors undertake a comprehensive analysis of the the platform's features, benefits, prospects, and ongoing challenges associated with the implementation of the platform. The analysis reveals that while MOOCs hold transformative potential for youth education, their success depends critically on addressing infrastructure gaps, supporting learner autonomy, and building meaningful learning communities, challenges that remain particularly acute in India's diverse and often underserved educational landscape

Keywords: SWAYAM-MOOCs, digital learning, youth education, conceptual framework, learning theories, India

1. Introduction

Futurist Alvin Toffler predicted, "In the 21st century, the illiterate will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn" (as cited in Tinio, 2003, p. 5). This assertion resonates profoundly within the contemporary educational milieu characterized by rapid transformation. Over the preceding fifteen years, globalization and technological change have escalated significantly, creating what Tinio (2003) describes as a novel global economy - one powered by technology, fueled by information, and driven by knowledge. For educational institutions, the implications are far-reaching: rather than merely transmitting static knowledge, they are obliged to empower students with the competencies necessary to navigate, evaluate, and continuously refine their knowledge and understanding throughout their lifetimes.



Education has always been pivotal to the advancement of human civilization, however, its manifestations have undergone significant transformations throughout history. Learners of the present day find themselves in the midst of what many scholars term the Fourth Industrial Revolution, where digital transformation touches virtually every aspect of society. In India, this digital revolution carries particular significance. The nation is strategically positioning itself as a front-runner within the global knowledge economy, as digital technologies are bringing significant transformations across various sectors including banking, agriculture, health, education, rural development, and financial inclusion (Ambadkar, 2020). The Industrial Revolution 4.0 has permeated higher education institutions, compelling them to address digital transformation across all facets of their operations (Alenezi, 2023). The incorporation of Information and Communication Technology (ICT) into the educational sphere has fundamentally transformed pedagogical methodologies and learner engagement. Digital learning, which utilizes technological advancements to disseminate educational materials, has revolutionized conventional classroom interactions and dramatically expanded educational accessibility (Lin et al., 2017). Among the diverse innovations within the realm of digital education, Massive Open Online Courses (MOOCs) emerge as potentially transformative entities. MOOCs promise to democratize access to quality education by offering free, open courses from premier institutions to anyone with an internet connection (Inchiparamban & Pingle, 2016).

For India, characterized by its extensive demographic, pronounced educational disparities, and ambitious development goals, Massive Open Online Courses (MOOCs) embody both an exceptional prospect and a significant challenge. Are these platforms capable of effectively reaching the multitudes of young Indians who are deprived of access to quality education? Can they overcome the obstacles posed by language, connectivity, and digital literacy? Furthermore, and perhaps most crucially, can they facilitate meaningful learning experiences that foster authentic skill development and knowledge acquisition? These questions have taken on particular urgency as India has invested heavily in its national MOOC platform, SWAYAM (Study Webs of Active Learning for Young Aspiring Minds, 2017, 2020, 2024). Understanding how MOOCs function and the reason for their occasional failure to fulfill their commitments requires more than mere enumeration of attributes or counting of enrollments. It requires a theoretical framework capable of elucidating the intricate interactions among technology, pedagogy, learner characteristics, and contextual factors (Malode, 2022). This paper develops such a framework, integrating insights from constructivist learning theory, connectivism (Siemens, 2005), self-regulated learning (Zimmerman, 2002), and the community of inquiry model (Garrison et al., 2000). The framework provides a comprehensive analytical viewpoint through which to assess the execution of SWAYAM in India, highlighting both the platform's considerable potential and the notable challenges that require resolution for the potential to be fully fulfilled.

2. Conceptual Framework for Understanding MOOCs

2.1 The Need for Theoretical Grounding

MOOCs emerged rapidly in the early 2010s, often driven more by technological enthusiasm than pedagogical theory (Chauhan & Goel, 2017). Early MOOC providers focused primarily on scaling access - getting courses online and attracting massive enrollments. Yet as the initial excitement subsided and completion rates proved disappointingly low, researchers and practitioners began asking more fundamental questions: What does it actually take for someone to learn effectively in a MOOC environment? In what ways do Massive Open Online Courses (MOOCs) diverge from conventional



educational settings, and what ramifications do these divergences present for the design of instructional methodologies? What factors contribute to the success of certain learners in MOOCs while others encounter significant challenges? (Kizilcec et al., 2017)

These questions cannot be answered through atheoretical observation alone. Learning represents a multifaceted phenomenon influenced by cognitive processes, social interactions, motivational factors, and environmental contexts. To understand how MOOCs can effectively educate youth, particularly in a diverse and challenging context like India, requires drawing on established learning theories while also recognizing the unique characteristics of the MOOC environment (Latha, 2019).

The framework developed here integrates four complementary theoretical perspectives, each illuminating different aspects of the MOOC learning experience:

1. **Constructivism**, which helps explain how learners actively build knowledge through engagement with content and tasks.
2. **Connectivism**, which examines the intricately networked and distributed characteristics of learning within digital contexts (Siemens, 2005).
3. **Self-regulated learning theory**, which underscores the pivotal significance of learner autonomy and metacognitive skills (Zimmerman, 2002).
4. **Community of inquiry model**, which emphasizes the importance of social presence, cognitive presence, and teaching presence in fostering meaningful educational experiences (Garrison et al., 2000).

Collectively, these theoretical frameworks provide a comprehensive perspectives for the analysis of SWAYAM-MOOCs, elucidating both potential advantages and inherent challenges.

2.2 Theoretical Foundations

2.2.1 Constructivism: Building Knowledge Through Active Engagement

Constructivism, based on the theories of Jean Piaget and Lev Vygotsky, views learning as active knowledge construction and not passive absorption. Learners construct new ideas through existing experiences and beliefs (Malode, 2022). Massive Open Online Courses (MOOCs) must extend beyond video lectures by providing opportunities for engagement, practical application, constructive feedback, and iterative refinement. Vygotsky's theoretical framework regarding the Zone of Proximal Development (ZPD) highlights the efficacy of learning in activities the slightly surpass an individual's independent capabilities, facilitated by the provision of scaffolding. MOOCs can achieve this through structured content, adaptive assessments, peer feedback, and discussion forums, rendering the experiences more challenging than the traditional classroom settings. Constructivism also stresses social interaction as the key factor for collaborative knowledge-building, yet many MOOCs fall short, considering learning as solitary (Garrison et al., 2000).

2.2.2 Connectivism: Learning in Networked Environments

While constructivism fits traditional settings, Siemens (2005) connectivism suits digital networks where knowledge lives across people, resources, and technology. Core ideas for MOOCs include seeing knowledge as navigable networks, valuing fresh content over rote memory, and fostering connections between ideas, learners, and experts. Diversity becomes a strength through cross-cultural dialogue. For India's SWAYAM, this promises regional networks (Nayaka, 2020), but demands designs for navigation and connections, not just content access (Chakravarty & Kaur, 2016).



2.2.3 Self-Regulated Learning: Mastering Autonomy

MOOCs completion rates often fall below 10% because they demand self-regulation: goal-setting, time management, monitoring, and grit (Kizilcec et al., 2017; Zimmerman, 2002). Zimmerman's SRL cycle has three phases: forethought (goal-setting, planning, self-efficacy checks), performance (strategy use, metacognition), and reflection (evaluating and adapting). Stronger SRL predicts success, but many learners especially from rote-learning backgrounds lack self-regulated learning skills, which create a paradox where MOOCs may favor the privileged. India, teacher-centered traditions leave gaps (Latha, 2019), so SWAYAM needs orientation modules, progress tools, and fading scaffolds to build these skills (Ambadkar, 2020).

2.2.4 Community of Inquiry: Creating Meaningful Learning Experiences

The Community of Inquiry (CoI) framework, developed by Garrison et al. (2000), blends three fundamental components for rich learning: cognitive (meaning-making through reflection and dialogue), social (emotional bonds and risk-taking), and teaching (design, facilitation, direction). Quality content alone cannot be accomplished so, MOOCs need dialogue and community for higher-order thinking. Scaling challenges include feedback, dispersed social ties, and static teaching, but solutions lie in peer assessments, group activities, connectivity tool, and distributed facilitation by teams and mentors (Malode, 2022).

2.3 Integrated Conceptual Framework

The four theoretical perspectives: constructivism, connectivism (Siemens, 2005), self-regulated learning theory (Zimmerman, 2002), and the community of inquiry framework (Garrison et al., 2000) offer complementary insights into MOOC learning. This study integrates these four theoretical perspectives into a model with four key components which are as follows:

Component 1: Contextual Factors

Learning does not happen in isolation. It occurs within a broader context like prior educational experiences, socioeconomic conditions, cultural backgrounds, technological infrastructure, and policies (Latha, 2019). In India, language diversity, different digital literacy levels, inconsistent internet, and cultural attitudes toward online learning significantly affect the efficacy of MOOCs (Chakravarty & Kaur, 2016; Ambadkar, 2020). These contextual factors function at several levels: individual (prior knowledge, home environment), institutional (credit policies), and system levels (Ambadkar, 2020).

Component 2: Design and Delivery of MOOCs

The design and delivery of MOOCs profoundly influence learning outcomes (Malode, 2022). This component encompasses several dimensions such as: pedagogical approaches like constructivist active learning, connectivist ideas to promote network formation and connection-making (Siemens, 2005) and self-regulated learning skills (Zimmerman, 2002); high-quality, accurate, relevant, and culturally suitable content. Additionally, the technological platform includes intuitive, mobile-friendly platforms (Chauhan & Goel, 2017). Interaction design includes learner-content, learner-instructor, and learner-learner interactions with peer feedback (Garrison et al., 2000); and assessments that align with objectives and yield valued certifications (Roshni, 2022).

Component 3: Learning Processes

This component focuses on what actually happens as learners engage with MOOCs. It integrates insights from all four theoretical perspectives. During MOOC engagement, learners actively construct knowledge through material interaction (constructivism), rather than passive consumption; navigate



networks and evaluate resources (connectivism) (Siemens, 2005); goal-setting, time management, self-monitoring, persistence, and metacognitive development (self-regulated learning) (Zimmerman, 2002; Kizilcec et al., 2017); and foster discourse, social presence, and instructional guidance (community of inquiry) (Garrison et al., 2000). These processes demand careful and intentional design, foundational support, and supplementary services to achieve successful implementation.

Component 4: Learning Outcomes

MOOCs succeed when learners truly grasp knowledge and skills, earn credentials (Roshni, 2022), build confidence for careers, spark lifelong learning (Tinio, 2003), and drive social goals like equity and mobility (Inchiparamban & Pingle, 2016). But outcomes often diverge – one learner may gain deep insights without completion, while another finishes without comprehension. Thus, evaluations must balance multiple measures, respecting priorities of learners, employers, and policymakers (Latha, 2019).

2.4 Framework Application to SWAYAM

This integrated framework provides a structured lens for analyzing SWAYAM MOOCs in India, moving beyond surface features to examine key dimensions. India's linguistic diversity, uneven digital infrastructure, and varied backgrounds significantly shape SWAYAM's access and success, with specific barriers hindering participation (Chakravarty & Kaur, 2016). SWAYAM courses incorporate constructivist active learning, connectivist networking (Siemens, 2005), self-regulated skills (Zimmerman, 2002), and community of inquiry presences to varying degrees (Garrison et al., 2000). Learners engage by actively constructing knowledge, building networks, self-regulating (Kizilcec et al., 2017), and participating in communities, though passive consumption persists in some cases. SWAYAM demonstrates knowledge gains, completion rates, valued credentials (Roshni, 2022), and contributions to equity, while also risking widened gaps (Latha, 2019).

The following sections apply this framework to examine SWAYAM's features, benefits, prospects, and challenges, revealing both the platform's considerable promise and the substantial obstacles that must be addressed for that promise to be realized.

3. SWAYAM: India's National MOOC Platform

3.1 Overview and Features

SWAYAM (Study Webs of Active Learning for Young Aspiring Minds) was launched by the Government of India in 2017 as part of the Digital India initiative (Study Webs of Active Learning for Young Aspiring Minds, 2017). The platform represents an ambitious effort to democratize education by providing free, high-quality online courses accessible to anyone with an internet connection (Nayaka, 2020; Vijayashekaranyaka, 2020).

The platform's design reflects several key principles. First, SWAYAM aims to bridge the digital divide by facilitating the dissemination of high-quality education even to the most disadvantaged (Chauhan & Goel, 2017). Learners or any individual who may never have the opportunity of enrolling in prestigious institutions like the Indian Institutes of Technology (IITs) or Indian Institutes of Management (IIMs) can avail themselves of courses developed by faculty members from these esteemed institutions. Second, SWAYAM seeks to address the shortage of qualified teachers in many subjects and regions by making expert instruction widely available (Agrawal & Singh, 2019). Third, the platform is designed to complement rather than replace traditional education, with many universities granting credit for SWAYAM course completion (Study Webs of Active Learning for Young Aspiring Minds, 2020).



SWAYAM courses follow a structured format designed to balance flexibility with pedagogical effectiveness. These courses are structured around a four-quadrant approach to provide comprehensive, high-quality, and interactive online learning experience. The four-quadrant includes:

Quadrant-I (e-Tutorial or Video lectures): This includes short, focused video segments (usually 10-15 minutes) that present core concepts. These are intentionally kept brief to maintain learner attention and allow for flexible viewing on mobile devices, a crucial consideration given that many Indian students primarily access the internet via smartphones (Ambadkar, 2020).

Quadrant-II (e-Content or Reading materials): This includes downloadable PDFs, e-books, and web links that provide additional depth and allow learners to engage with content at their own pace. These materials are particularly important for learners with limited internet bandwidth who may struggle to stream videos consistently.

Quadrant-III (Discussion Forums or Web Resources): This covers the online spaces where learners can ask questions, discuss concepts, and interact with peers and instructors. These forums have the potential to create the social and cognitive presence emphasized by the Community of Inquiry framework (Garrison et al., 2000), though their effectiveness depends heavily on active moderation and participation.

Quadrant-IV (Self-assessment): This encompasses quizzes and practice problems that allow learners to check their understanding. These provide immediate feedback, supporting the self-regulated learning process by helping learners identify gaps in their knowledge (Zimmerman, 2002). Additionally, assignments and assessment contribute to course completion and certification which may vary in format from multiple-choice quizzes to essay assignments and project work, depending on the course level and subject matter.

The platform covers a wide range of subjects across different educational levels. Courses are available for high school students (classes 9-12), undergraduate students, postgraduate students, and even professional development for working adults (Study Webs of Active Learning for Young Aspiring Minds, 2024). Subjects span engineering, sciences, humanities, social sciences, management, and more. This breadth is important because it means SWAYAM can potentially serve diverse learner needs rather than focusing narrowly on a few high-demand fields (Nayaka, 2020).

A particularly important feature of SWAYAM is its credit transfer system. The University Grants Commission (UGC) has approved regulations allowing students to earn up to 40% of their degree credits through SWAYAM courses (Study Webs of Active Learning for Young Aspiring Minds, 2024). This policy addresses a critical challenge facing many MOOC platforms: the question of credential value (Roshni, 2022). When universities formally recognize SWAYAM courses for credit, it signals their quality and legitimacy, providing students with tangible incentives for completion.

3.2 SWAYAM's Alignment with Theoretical Framework

Examining SWAYAM through the lens of the integrated conceptual framework reveals both strengths and areas where implementation could be improved:

Constructivist principles: SWAYAM's inclusion of assignments, projects, and discussion forums provides opportunities for active knowledge construction rather than passive content consumption. However, the extent to which individual courses actually leverage these features varies considerably (Malode, 2022). Some courses include rich, authentic tasks that require learners to apply concepts in novel contexts; others rely primarily on multiple-choice quizzes that may test recall rather than deep understanding.



Connectivist principles: SWAYAM has the potential to create learning networks that span India's geography and diversity (Siemens, 2005). Discussion forums could facilitate connection-making across different perspectives and contexts. However, realizing this potential requires active community building, something that doesn't happen automatically simply because a forum exists (Chakravarty & Kaur, 2016). Many SWAYAM courses have relatively inactive forums, limiting opportunities for network-based learning.

Self-regulated learning support: SWAYAM provides some features that support self-regulation, such as progress tracking and flexible pacing (Zimmerman, 2002). However, many learners particularly those from educational backgrounds that emphasized teacher direction over learner autonomy may need more explicit support in developing self-regulated learning skills (Latha, 2019). Orientation modules on time management, goal setting, and learning strategies could strengthen SWAYAM's effectiveness.

Community of inquiry: Creating cognitive, social, and teaching presence in SWAYAM courses is challenging given the massive scale (Garrison et al., 2000). Cognitive presence can be supported through well-designed assignments and discussion prompts. Social presence requires active community building, which is difficult with thousands of learners but possible through structured peer interaction and small group activities. Teaching presence must largely be "designed in" rather than provided dynamically, though some courses employ teaching assistants or peer mentors to provide more personalized guidance.

4. Benefits of SWAYAM-MOOCs for Youth Education

SWAYAM-MOOCs offer Indian youth real opportunities across access, quality, flexibility, and equity, making high-quality education more attainable.

4.1 Democratizing Access to Quality Education

SWAYAM breaks down barriers for rural, disadvantaged, or disabled students by delivering IIT-level courses to anyone with internet (Inchiparamban & Pingle, 2016; Nayaka, 2020). A village student in Chhattisgarh can now access elite lectures without competitive admissions or relocations (Chakravarty & Kaur, 2016). Similarly, working adults and repeat learners also benefit from home-based, self-paced access which is considered as one of the major potential benefits of SWAYAM-MOOCs (Ambadkar, 2020).

4.2 Addressing Teacher Shortages and Quality Gaps

With teacher gaps in STEM and rural areas, SWAYAM provides expert instruction wherever local faculty fall short (Agrawal & Singh, 2019). Small colleges can integrate data science courses from top professors, complementing, not replacing local teachers through flipped classrooms (Nayaka, 2020; Chauhan & Goel, 2017).

4.3 Flexibility and Learner Autonomy

Unlike rigid schedules, SWAYAM offers anytime access, adjustable pacing, location freedom, and diverse content choices (Ambadkar, 2020). Learners study when alert, rewind tough sections, and explore interests absent locally, all fostering the self-regulation modern education demands (Zimmerman, 2002; Lin et al., 2017).

4.4 Cost-Effectiveness

Free content and low certification fees slash expenses on tuition, travel, and books, enabling poor families to build skills and mobility, if employers value credentials (Latha, 2019; Roshni, 2022; Nayaka, 2020).



4.5 Lifelong Learning and Skill Development

The rapid pace of technological and economic change means that the knowledge and skills acquired during formal education may become outdated quickly (Tinio, 2003). MOOCs support this need for lifelong learning in several ways (Ambadkar, 2020). Rapid job changes demand constant upskilling (Vijayashekaranyaka, 2020). Thus, SWAYAM allows learners to explore fields before committing to formal programs, learn AI or analytics without career breaks, allows them to fill these gaps at their own pace, building foundations for further learning (Chauhan & Goel, 2017). Consequently, SWAYAM courses can be updated more quickly than traditional textbooks, helping learners stay abreast of the latest developments (Siemens, 2005).

4.6 Fostering Digital Literacy

SWAYAM courses inherently develops digital literacy skills that are increasingly essential in today's world (Lin et al., 2017). Navigating platforms builds essential technology skills, especially for rural youth, narrowing divides, building confidence and competence with digital tools they need for digital workplaces (Alenezi, 2023; Chakravarty & Kaur, 2016).

5. Prospects for SWAYAM-MOOCs in India

SWAYAM-MOOCs have significant potential to contribute to India's educational and economic development. Several trends and opportunities suggest promising prospects.

5.1 Expanding Internet Infrastructure

India has made substantial progress in expanding internet access over the past decade (Ambadkar, 2020). Internet users have increase dramatically, mobile data costs have declined significantly, the BharatNet project, and widespread smartphones mean more students can reach SWAYAM courses, even from far-off villages where laptops are still out of reach (Nayaka, 2020; Chauhan & Goel, 2017).

5.2 Integration with Formal Education

As more universities recognize SWAYAM courses for credit and integrate them into degree programs, the platform's value proposition strengthens (Study Webs of Active Learning for Young Aspiring Minds, 2024). With official credit approval, colleges can mix SWAYAM courses into degrees through blended classes or hybrid approaches (Agrawal & Singh, 2019), flipped classrooms by using SWAYAM content for out-of-class learning, freeing class time for active learning activities, discussions, and personalized support (Chauhan & Goel, 2017). Additionally, it provides extra help for struggling students, or faster completion, offering more subjects without hiring extra teachers (Vijayashekaranyaka, 2020).

5.3 Employer Recognition and Workforce Development

For SWAYAM to truly democratize economic opportunity, employers must recognize and value SWAYAM credentials (Roshni, 2022). As India's economy continues to evolve, with growing emphasis on knowledge work and digital skills, SWAYAM can play an important role in workforce development (Ambadkar, 2020). Technology companies are starting to value SWAYAM certificates for real skills, helping workers adapt quickly to changing market in India (Tinio, 2003).

5.4 Personalization Through Learning Analytics

SWAYAM courses could be more individualized and adaptive with emerging technology (Malode, 2022). According to Kizilcec et al. (2017), adaptive systems could automatically adjust the difficulty of content in accordance with the performance of the learner, scaffolding struggling learners and enriching fast learners. Predictive models can identify learners who are at risk of dropping out, providing support



and encouragement. Although the current implementation of these technologies by SWAYAM is restricted, there is the potential to capitalize on these tools to improve their effectiveness and accommodate the diverse requirements of learners (Alenezi, 2023).

5.5 Localization and Cultural Relevance

SWAYAM has challenges and opportunities from India's linguistic and cultural diversity (Chakravarty & Kaur, 2016). Most courses are offered in English or Hindi, which may exclude non-English speakers. Expanding regional language courses would significantly broaden access (Chauhan & Goel, 2017). Beyond language, content can reflect India's culture and address local relevant issues. Indian students will find courses that relate abstract concepts to real-world problems, highlight Indian issues, and appreciate diversity more interesting (Latha, 2019).

6. Challenges Face in SWAYAM-MOOCs in India

Despite SWAYAM's considerable potential, significant challenges must be addressed for that potential to be fully realized. These challenges operate at multiple levels including technological, pedagogical, social, and institutional.

6.1 The Digital Divide

While India has made progress in expanding internet access, substantial digital divides persist (Chakravarty & Kaur, 2016). These divides operate along multiple dimensions including infrastructural gaps, limitations to device access, data expenses leading to unaffordable luxury, and lack of digital skills or technology hinders those who need education the most (Chauhan & Goel, 2017; Ambadkar, 2020; Latha, 2019; Lin et al., 2017).

6.2 Language Barriers

India is extraordinarily linguistically diverse, with hundreds of languages spoken across the country (Latha, 2019). While English and Hindi are widely used in education, this dominance excludes other regional language speakers as majority of teachers are more comfortably with using regional languages (Chauhan & Goel, 2017). Consequently, this challenge demands culturally adapted content beyond mere translation. Similarly, students from elite urban backgrounds are more likely to have strong English skills, while those from rural areas or disadvantaged communities may have limited English proficiency (Chakravarty & Kaur, 2016). If SWAYAM courses require strong English skills, they may inadvertently reinforce existing educational inequalities rather than reducing them.

6.3 The Self-Regulation Challenge

As discussed in the theoretical framework section, MOOCs require high levels of self-regulated learning skills (Zimmerman, 2002). Learners must maintain goal-setting, time management, maintain motivation without external accountability, and persist through difficulties. Research consistently shows that many learners struggle with these demands (Kizilcec et al., 2017). This challenge is particularly acute India's educational system as traditional classroom teaching emphasized teacher-directed instruction, rote memorization, and external motivation through exams (Latha, 2019) leading to students having a limited opportunities to develop autonomous learning skills. Therefore, the completion rates below 10% reflect rote-learning backgrounds and competing life demands which requires built-in SRL training (self-regulated learning), progress trackers, and structured nudges (Kizilcec et al., 2017; Zimmerman, 2002)

6.4 Quality and Pedagogical Concerns

SWAYAM courses vary widely in quality. Some offer strong pedagogy and online interactivity, while others are simply recorded lectures known as the "shovelware" approach that moves classroom content



online without adaptation (Malode, 2022). This stems from faculty lacking instructional design skills, limited time for development, and uneven quality controls (Agrawal & Singh, 2019). Some of the major issues include limited instructor and peer interaction (despite forums), which restricts social and cognitive presence (Garrison et al., 2000); multiple-choice quizzes testing recall rather than deep understanding; uniform content ignoring diverse learner needs (Kizilcec et al., 2017); and insufficient instructor support beyond peer forums (Latha, 2019). Improvement requires faculty training, design assistance, consistent quality checks, and scaled innovations in interaction, assessment, and personalization (Agrawal & Singh, 2019).

6.5 Credential Recognition and Value

For SWAYAM to genuinely expand educational and economic opportunity, employers, educational institutions, and society must value its credentials yet recognition remains inconsistent despite UGC credit rules and growing employer interest (Roshni, 2022). Several factors complicate credential recognition including inconsistent course quality, which makes it hard for the learners to know what a SWAYAM certificate really means (Malode, 2022), doubts about cheating despite proctoring, and lingering bias that online learning are not as good as traditional degrees, despite the learning outcomes (Latha, 2019). Building credential value requires maintaining high standards for course quality, secure assessment and verification systems, publicizing success stories of SWAYAM learners, engaging employers in discussions about skills and competencies, and sustained brand-building efforts (Roshni, 2022).

6.6 Motivation and Engagement

One of the major challenges in online learning is keeping the learners motivated and engaged throughout a MOOC course as it requires self-regulated learning to maintain momentum (Kizilcec et al., 2017). Several factors contribute to motivation challenges includes lack of social presence (Garrison et al., 2000), competing demands (Latha, 2019, unclear goals or expectations (Ambadkar, 2020), and lack of immediate applicability (Zimmerman, 2002). Courses that make connections to real-world applications and help learners see the relevance of what they're learning tend to be more engaging.

Thus, overcoming motivation issues calls for deliberate course design that focuses on fostering social connections and community, guiding learners to establish clear goals and monitor progress, offering consistent feedback and encouragement, highlighting real-world applications, and delivering diverse, engaging activities instead of repetitive content delivery (Garrison et al., 2000; Kizilcec et al., 2017).

6.7 Institutional Resistance and Inertia

Despite policy support for SWAYAM, implementation at the institutional level has been uneven (Agrawal & Singh, 2019). Certain universities have integrated SWAYAM into curricula with enthusiasm, while others remain reluctant, citing skepticism toward online efficacy or perceived threats to conventional pedagogy. Several factors contribute to institutional resistance including concerns like replacement of faculty by MOOCs that devalue their expertise (Chauhan & Goel, 2017), administrative challenges like integrating SWAYAM into existing systems leading to extra workload (Malode, 2022), cultural inertia which takes time and sustained effort for change (Latha, 2019), and SWAYAM course quality where some institutions hesitate to grant credit for courses lacking prior institutional approval (Roshni, 2022). Overcoming this need evidence of SWAYAM's value, implementation support, faculty dialogues, professional development, and adoption incentives (Agrawal & Singh, 2019).



7. Conclusion

This paper analyzed SWAYAM-MOOCs through an integrated conceptual framework blending constructivism, connectivism (Siemens, 2005), self-regulated learning theory (Zimmerman, 2002), and the community of inquiry model (Garrison et al., 2000). Rather than viewing MOOCs as automatic or inherently flawed approaches, this theoretical lens reveals the effectiveness and success on thoughtful interplay between contextual factors, design choices, learning processes, and outcomes.

SWAYAM represents an ambitious and potentially transformative initiative (Nayaka, 2020; Vijayashekarayanayaka, 2020). It brings IIT-quality courses to anyone with internet challenges like inequalities, addressing teacher shortages, offering flexible low-cost learning, and building lifelong skills for youth facing rapid change and fostering digital literacy (Inchiparamban & Pingle, 2016; Tinio, 2003; Ambadkar, 2020; Lin et al., 2017). These benefits are particularly significant for youth, who face an uncertain future requiring continuous skill development and adaptation (Tinio, 2003).

However, significant challenges remain. The digital divides exclude those who need educational opportunities the most (Chakravarty & Kaur, 2016; Chauhan & Goel, 2017). Similarly, language barriers exclude many potential learners (Latha, 2019) and the self-regulation demands learners who already possess sophisticated learning skills (Kizilcec et al., 2017; Zimmerman, 2002). Additionally, course quality varies considerably across courses, and pedagogical approaches (Malode, 2022) and the credential recognition remains inconsistent, limiting SWAYAM's ability to expand economic opportunity (Roshni, 2022). Motivation and engagement are persistent challenges (Garrison et al., 2000) where institutional adoption has been uneven (Agrawal & Singh, 2019).

Addressing these challenges requires action at multiple levels. At the policy level, continued investment in digital infrastructure, course development in regional languages, and efforts to build credential recognition are essential (Study Webs of Active Learning for Young Aspiring Minds, 2024). At the institutional level, faculty training, quality assurance, and curriculum integration must be organized (Agrawal & Singh, 2019). At the course design level, developers need to prioritize interactivity where learners are engaged in activity to promote active construction of knowledge, network formation that builds community, self-regulation support, and provide meaningful assessment (Garrison et al., 2000; Zimmerman, 2002).

It is important to keep in mind that MOOCs only complement the conventional classroom teaching rather than replacing the traditional education (Chakravarty & Kaur, 2016). They are tools and its effectiveness depends on how they're designed, implemented, and supported when face-to-face instruction, peer learning, mentorship, and support services are included (Chauhan & Goel, 2017).

The conceptual framework developed in this paper provides guidance for strengthening SWAYAM implementation. From a constructivist perspective, courses must emphasize active learning and not passive content consumption. From a connectivist perspective, they must facilitate network-building and connection-making across diverse learners and resources (Siemens, 2005). From a self-regulated learning perspective, MOOCs must explicitly support the development of autonomous learning skills (Zimmerman, 2002; Kizilcec et al., 2017). And lastly, from a community of inquiry perspective, MOOCs must intentionally create cognitive, social, and teaching presence (Garrison et al., 2000).

The prospects of SWAYAM depend on learning from experience, experimenting with innovations, and continuously improving based on evidence. Future directions include expanding internet access, integrating MOOCs into formal curricula, strengthening employer recognition, applying learning



analytics for personalization and creating multilingual, culturally relevant content (Ambadkar, 2020; Alenezi, 2023; Nayaka, 2020).

For Indian youth, SWAYAM offers unprecedented access to quality education, flexible learning, and economic pathways (Inchiparamban & Pingle, 2016; Vijayashekaranyaka, 2020), but demands of self-regulation learning skills, digital literacy, and persistence are often unsupported in traditional systems (Latha, 2019; Zimmerman, 2002).

Ultimately, SWAYAM-MOOCs' impact on educating Indian youth largely depends not by technology alone but more on the resolution of policymakers, educators, institutions, and society to make digital learning truly equitable, lifting opportunities rather than deepening inequalities (Chakravarty & Kaur, 2016; Tinio, 2003). The framework and analysis presented both its exciting potential and practical challenges, offering clear guidance for India's diverse educational context.

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ABSTRACT

MASSIVE OPEN ONLINE COURSES IN CENTRAL UNIVERSITIES OF NORTH EAST INDIA: STATUS, PROBLEMS AND PERCEPTIONS OF STAKEHOLDERS

**AN ABSTRACT SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY**

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DEPARTMENT OF EDUCATION

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APRIL, 2026

**MASSIVE OPEN ONLINE COURSES IN CENTRAL UNIVERSITIES
OF NORTH EAST INDIA: STATUS, PROBLEMS AND PERCEPTIONS
OF STAKEHOLDERS**

BY
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Department of Education

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Submitted
In partial fulfillment of the requirement of the Degree of Doctor of Philosophy
in Education of Mizoram University, Aizawl

1. INTRODUCTION

The digital revolution in India is playing a crucial role and this revolution is causing significant changes in various sectors, including banking, education, shopping, agriculture, health, rural development, and financial inclusion, among others (Ambadkar, 2020a). Higher education is a significant focus area of the digital revolution in India, with innovative technologies disrupting traditional teaching and learning methods. In the article of Ambadkar (2020b), this shift towards digitization is paving the way for India to become a 'Knowledge Economy'.

With the advent of the internet, the development of information and communication technologies, and the globalization of technology, distance education, or online learning, has undergone a tremendous transformation in the transmission of knowledge and the learning processes of consumers. The emergence of Web 2.0 has provided various online platforms for consumers and significantly impacted online learning systems. Thus, to understand learning in this digital era, to provide a richer learning environment, and to foster interaction and interconnection among a wide variety of participants through online tools, the term “Massive Open Online Course (MOOC)” emerged (Latha, 2019a). Massive Open Online Courses (MOOCs) are a key driver of technological innovation in education in India. These courses allow thousands of learners to participate simultaneously in free, open courses, regardless of their geographic location (Ambadkar, 2020a).

A Massive Open Online Course (MOOC) is a web-based platform that enables an unlimited number of students worldwide to access distance education through the collaboration of the world's top institutes (Agrawal & Singh, 2018). It can also be described as an online course available to many participants, accessible to anyone with an internet connection. This online course is open to everyone without entry qualifications and offers a complete course through an online mode (Latha, 2019b).

Agrawal and Singh (2018) have given a comprehensive meaning and definition of MOOC in which ‘Massive’ refers to large-scale participation of users, ‘Open’ defines courses that are open for all, which may be open access, open syllabi,

self-directed and open content learning environments, ‘Online’ which shows that courses are available in online mode via internet and ‘Course’ denotes the structures of courses which are offered online to the participants or the concept of a pedagogically designed to online learning.

2. RATIONALE OF THE STUDY

Through the ‘*Credit Framework for Online Learning Courses through SWAYAM*’ Regulations passed in 2016 and the new Regulations of 2021, the University Grants Commission (UGC) has instructed universities to make amendments in their Ordinances, Rules, Regulations, etc. to incorporate provisions for credit mobility and recognition for Seamless Integrations of Massive Open Online Courses (MOOCs) offered through the SWAYAM platform. As instructed by the UGC, MOOCs provide knowledge to students who may not have access to higher education and help learners who cannot afford the costs associated with higher education. So, MOOCs are a valuable form of online learning that complements the country's traditional university learning. It is essential to determine whether the country's universities have adhered to the ordinances, rules, and regulations established by the UGC when offering Massive Open Online Courses (MOOCs).

The researcher has analyzed 69 empirical and conceptual studies over a period of 14 years (2010-2024), examining various dimensions of Massive Open Online Courses (MOOCs), including both international and Indian studies. These studies examine several aspects, including the theoretical foundations of MOOCs, pedagogical and technological challenges, perspectives of learners and instructors, institutional readiness, and the evolving opportunities in online and blended learning environments. The Indian higher education has focused on national digital learning initiatives such as SWAYAM, NPTEL, and several e-learning platforms designed to democratize access to quality education.

Despite this growing body of research, there remains a need to understand the current status, implementation barriers, and contextual challenges encountered by various stakeholders including teachers, students, and administrators, particularly

within higher education institutions in the North Eastern region of India. The distinct socio-cultural, infrastructural, and digital disparities in this region require a targeted investigation to obtain accurate insights into the perception, adoption, and sustainability of MOOCs within central universities.

Therefore, this study aims to examine the current status of MOOCs, identify challenges encountered by stakeholders, and analyze their perceptions toward online learning in the context of central universities in North East India. The findings aim to provide significant recommendations for improving the design, accessibility, and effectiveness of MOOCs within the Indian higher education framework, thus advancing the national vision of inclusive and technology-oriented education.

3. RESEARCH QUESTIONS

1. What has been the development of MOOCs in the central universities of North East India?
2. What plans and programs have been developed for implementing MOOCs in the central universities of Northeast India?
3. What are the issues with MOOC design, development, and implementation in the central universities of North East India?
4. What are the perceptions of university students towards learning through MOOCs?
5. Is there any difference in university students' perceptions of learning through MOOCs regarding stream of studies and gender?
6. What are the perceptions of university teachers on the pedagogy and learning design of MOOCs?
7. Is there any difference in the perceptions of university teachers on the pedagogy and learning design of MOOCs concerning the stream of studies, gender, and teaching experience?

4. STATEMENT OF THE PROBLEM

To answer the questions raised above, the problem of the study had been stated as *“Massive Open Online Courses in Central Universities of North East India: Status, Problems and Perceptions of Stakeholders.”*

5. OBJECTIVES OF THE STUDY

The following objectives have been formulated based on the research questions to guide the study:

1. To assess the status of MOOCs in central universities of North East India.
2. To examine the plans and programmes formulated by the central universities of North East India to implement MOOCs in their university.
3. To reveal issues in connection with the design, development, and implementation of MOOCs in central universities of North East India.
4. To assess university students' perceptions of learning through MOOCs.
5. To compare university students' perceptions of learning through MOOCs with respect to gender and streams of study.
6. To assess the perceptions of university teachers of central universities of North East India on MOOCs' pedagogy and learning design.
7. To compare university teachers' perceptions of MOOCs' pedagogy and learning design with respect to gender, streams of study, and teaching experiences.
8. To suggest measures for better implementation of MOOCs in the central universities of North East India.

6. NULL HYPOTHESES OF THE STUDY

1. There is no significant difference in the perception of learning motivation on MOOCs between male and female students in the central universities of North East India.
2. There is no significant difference in the perception of the importance of learning through MOOCs between male and female students in the central universities of North East India.

3. There is no significant difference in the perception of the benefits of learning through MOOCs between male and female students in the central universities of North East India.
4. There is no significant difference in the perception of learning expectations of MOOCs between male and female students in the central universities of North East India.
5. There is no significant difference in the perception of the learning challenges through MOOCs between male and female students in the central universities of North East India.
6. There is no significant difference in the perception of learning motivation through MOOCs between arts and sciences students of the central universities of North East India.
7. There is no significant difference in the perception of the importance of learning through MOOCs between arts and sciences students of the central universities of North East India.
8. There is no significant difference in the perception of the benefits of learning through MOOCs between arts and sciences students of the central universities of North East India.
9. There is no significant difference in the perception of the learning expectations of MOOCs between arts and sciences students of the central universities of North East India.
10. There is no significant difference in the perception of the learning challenges through MOOCs between arts and sciences students in the central universities of North East India.
11. There is no significant difference in the perception of motivation for learning in MOOCs between male and female teachers in central universities of North East India.
12. There is no significant difference in the perceived benefits of learning through MOOCs between male and female teachers in central universities of North East India.

13. There is no significant difference in the perceived learning challenges through MOOCs between male and female teachers in central universities of North East India.
14. There is no significant difference in the perception of motivation for learning in MOOCs between arts and sciences teachers in central universities of North East India.
15. There is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences teachers in central universities of North East India.
16. There is no significant difference in the perceived learning challenges through MOOCs between teachers across the arts and science streams in central universities of North East India.
17. There is no significant difference in the perception of the motivation for learning in MOOCs between teachers with above ten years of teaching experience and below ten years in central universities of North East India.
18. There is no significant difference in the perception of the benefits of learning through MOOCs between teachers with above ten years of teaching experience and those with below ten years in central universities of North East India.
19. There is no significant difference in the perception of learning challenges through MOOCs between teachers with above ten years of teaching experience and those with below ten years in central universities of North East India.
20. There is no significant difference in the perceived learning design of MOOCs between male and female teachers in central universities of North East India.
21. There is no significant difference in perception of the development and implementation of learning on MOOCs between male and female teachers in central universities of North East India.
22. There is no significant difference in the perception of the learning design of MOOCs between teachers across the arts and science streams in central universities of North East India.

23. There is no significant difference in the perception of the development and implementation of learning on MOOCs between teachers across arts and science streams in central universities of North East India.
24. There is no significant difference in the perceived learning design of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India.
25. There is no significant difference in the perception of the development and implementation of learning on MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India.

7. OPERATIONAL DEFINITIONS OF KEY TERMS

MOOC: In this study, MOOC refers to Massive Open Online Courses which are offered through the SWAYAM platform, launched by the Ministry of Education and the Government of India.

Stakeholders: In this study, stakeholders refer to the post-graduate students and teachers of the central universities of North East India.

Streams of Study: In this study, the streams of study include the arts and sciences streams.

Teaching Experience: In this study, the teaching experiences of the teacher were categorized into (i) above ten years, and (ii) below ten years

8. DELIMITATION OF THE STUDY

In the 2022-23 UGC-Report, it had been notified that there were eleven (11) central universities in the North Eastern India. Among these, the nine general central universities were under the Ministry of Education, Government of India and the other two were governed under other ministries. The study had been delimited to four central universities of North East India from the nine general universities under the Ministry of Education, Government of India. Thus, the four central universities of North East India in this study included Mizoram University (Mizoram), North

Eastern Hill University (Meghalaya), Manipur University (Manipur), and Nagaland University (Nagaland).

9. REVIEW OF RELATED LITERATURE

Studies conducted abroad and studies conducted in India comprising to a total of 69 studies within a span of 14 years (2010-2024) were reviewed in this study.

10. METHODOLOGY OF THE STUDY

10.1. Research Design

The study was descriptive in nature and mixed method was used to explore the adoption and implementation of Massive Open Online Courses (MOOCs) in the central universities of North East India, with a particular focus on the status, problems, and perceptions of stakeholders related to MOOCs. The variables studied included the adoption of MOOCs, issues related to their design and development, and the different dimensions of both teachers' and students' perceptions of MOOCs, specifically concerning gender, streams of study, and teaching experiences.

10.2. Population

According to the UGC Annual Report (2022-2023), there are officially 11 central universities across the eight North Eastern states of India (as cited in Daimary, 2024). As a result, all students and teachers at these nine general central universities namely, Rajiv Gandhi University (Itanagar, Arunachal Pradesh), Assam University (Silchar) and Tezpur University (Assam), Manipur University (Imphal, Manipur), North-Eastern Hill University (Shillong, Meghalaya), Mizoram University, (Aizawl, Mizoram), Nagaland University (Lumami, Nagaland), Sikkim University (Gangtok, Sikkim), and Tripura University (Agartala, Tripura), are the population of the study.

10.3. Sample

The study employed two phase sampling procedure:

Phase-1: The researcher selected four central universities of North East India in first phase. The central universities included in the study are the Mizoram University,

Nagaland University, Manipur University, and North-Eastern Hill University who had information about MOOC on their university websites through convenient sampling procedure.

Phase-2: Purposive sampling method was used to ensure a representative selection of stakeholders – both teachers and students from the four selected central universities of North East India.

Regarding the student respondents, the total sample size is 320, with each of the central universities contributing 80 participants. Similarly, concerning the teacher respondents, the total size is set at 64 respondents, with each central university contributing 16 participants.

Table 1

Sample Distribution of the students and teacher respondents according to universities

S/No.	Name of Universities	No. of Students	No. of Teachers
1.	Mizoram University	80	16
2.	Nagaland University	80	16
3.	Manipur University	80	16
4.	North Eastern Hill University	80	16
Total		320	64

The sample was divided into two subgroups - gender and streams of study for student respondents. A total of 80 students were selected from each university, with gender (Male and Female) and streams of study (Arts and Sciences) as the main variables. Similarly, a total of 64 teachers were selected as respondents using purposive sampling procedure to reach the study's objectives. Within each university, the teachers were further classified based on gender (Male and Female), streams of study (Arts and Sciences), and teaching experiences (Below ten years and Above ten years). This classification is essential because it recognizes the diverse backgrounds and needs of students and teachers, ensuring the study capture a

complete picture of stakeholders' perceptions of MOOCs and their overall status in the central universities of North East India.

10.4. Tools used for the study

To achieve the objectives of the study, the researcher developed the following tools: -

1. A semi-structured interview schedule was developed to study the status, plans and programs, and issues related to MOOC design, development, and implementation in central universities of North East India.
2. Questionnaire was developed to study the issues related to MOOC design, development, and implementation in central universities of North East India.
3. A questionnaire was developed for the students to study their perception of learning through MOOC.
4. The researcher developed a questionnaire to study the perceptions of central university teachers in North East India about the pedagogy and learning design of MOOCs.
5. Focus group discussions were conducted to collect in-depth relevant information.

10.5. Validity

The validation process involved analysing the content of the questionnaire. The researcher drafted the initial questionnaire, which was then reviewed and approved by education experts.

10.6. Reliability

The researcher administered the tools to 30 students and 15 teachers at Mizoram University. The response was collected from them, and reliability was calculated using the split-half method. The researcher calculated the R-value through Spearman's Rank Correlation Coefficient formula. Thus, the R-value of both tools was found to be 0.72 and 0.68, respectively. It was concluded that both questionnaires were highly reliable.

10.7. Procedure of data collection

After selecting the items and preparing the tools for data collection, the researcher began a comprehensive data-gathering process, visiting various central universities to collect valuable insights for achieving the study's objectives. To ensure a representative sample, the researcher distributed questionnaires to stakeholders at North Eastern Hill University, Nagaland University, Manipur University, and Mizoram University. The questionnaires were administered to a diverse group of participants, comprising both teachers and students across the arts and sciences streams.

A semi-structured interview schedule (open-ended questions) was administered to the MOOCs coordinator or any member of the council at each central university to inquire about the status of MOOCs in the university. The researcher personally approached all potential students and teacher respondents, as well as the MOOCs Coordinator or a member of the council, to gather the necessary data to meet the study's objectives. The data collection period was conducted from August 2022 to September 2023.

10.8. Data analysis and statistical techniques used

In this study, descriptive statistical techniques, primarily percentages and non-parametric tests, such as the Chi-square test, were used to analyse the data.

For qualitative analysis of data collected through Focus Group Discussions (FGDs), thematic analysis was employed due to its flexibility and effectiveness in identifying patterns across diverse participant responses.

11. MAJOR FINDINGS OF THE STUDY

11.1. Findings related to Objective 1:

Objective No.1: To assess the status of MOOCs in central universities of North East India.

To achieve objective no. 1 of the study, it has been divided into two parts-the first part highlighting the quantitative data and the second part showing the qualitative data about the status of MOOCs in each university visited by the researcher.

A.) Quantitative Findings

i.) Findings related to the status of students' awareness of MOOCs

- The results showed that out of the 320 surveyed students, 197 respondents, with 61.6%, were aware of MOOCs.
- Out of the 197 respondents who were found to have awareness of MOOCs, 60.9% (120) student respondents were from the arts streams, while 39.1% (77) were from the sciences stream.
- Moreover, the findings of the study also highlighted that out of the 197 respondents, 57.9% (114) were females and 42.1% (83) were males.
- From these findings, it can be seen that more than half of the surveyed students in the central universities of North East India were found to be aware of MOOCs. The results of the study showed that the students from arts were found to be more aware of MOOCs than sciences students, and that female students were more aware of MOOCs than their male counterparts.

ii.) Findings related to status of students' enrolment in MOOCs

- The findings of the study revealed that only few students, 65 (20.3%) out of the 320 surveyed students had enrolled in MOOCs, with 10.9% (35) being female and 9.4% (30) being male.
- Moreover, with regards to the streams of study, 11.6% (37) were from the sciences stream, while 8.8% (28) of the students enrolled in MOOCs were from the arts stream.

- Overall, the findings of the study suggested a low enrollment rate of students in SWAYAM-MOOCs in the central universities of North East India.

iii.) Findings related to students' source of knowledge of MOOCs

- Among the 61.6% (197 students) who have awareness of MOOCs, 46.7% (92 students) identified teachers as the primary source of information regarding MOOCs.
- This statistic highlights the pivotal role of teachers in promoting students' awareness of the importance, benefits, and potential career opportunities associated with MOOCs within the educational environment.
- Following teachers, the internet was found to rank as the second most significant source of knowledge, with 25.38% (50 students) attributing their understanding of MOOCs to online resources. This highlights the growing impact of digital platforms in educating students about educational innovations, such as MOOCs.
- The study also revealed that 16.24% (equivalent to 32 students) relied on their friends as their primary source of information about Massive Open Online Courses (MOOCs). This finding highlights the significant impact that peer groups have on both knowledge acquisition and the development of understanding in the contemporary educational landscape.
- Ranking fourth, with 6.59% (13 students), the university administration holds a significant position among various sources of knowledge,
- The study also found that family comes next in this hierarchy with 3.04%, demonstrating its role in knowledge sharing.
- On the other hand, the study showed that newspaper, with 2.03% was found to be positioned at the bottom, suggesting a lesser influence in this context.

iv.) Findings related to the students' awareness of online educational platforms

- It was found that SWAYAM, with 31.6%, was considered the most popular among the listed educational platforms.

- Following that, Udemy, NPTEL, and Coursera were the most popular among the respondents, receiving 16.9%, 15%, and 13.8% of the votes, respectively.
- OpenLearn was known to 10.3% of the respondents.
- edX and Udacity was known to 8.1% and 7.5% respectively.
- Only few with 5.3% were known to FutureLearn.
- The findings of the study revealed that the respondents recognized other educational platforms, indicating a broader awareness of online learning options.

v.) Findings related to the status of teachers' awareness and enrollment of MOOCs

- The results showed that all the 64 teachers surveyed (100%) in the central universities of North East India were aware of MOOCs.
- Out of the 64 teacher respondents, it can be seen that 42.2% (27) had enrolled in MOOCs, with 29.7% (19) being males and 12.5% (8) being females. The results showed that 25% (16) who had enrolled in MOOCs were from the arts streams, and 17.2% (11) were from the sciences streams. Moreover, the findings of the study also highlighted that 32.8% (21) were those having more than ten years of teaching experience, while only 9.4% (6) teachers who had enrolled in MOOCs were those having ten years below teaching experience.
- Overall, the findings of the study suggested that despite the widespread awareness of MOOCs, there was a low enrolment rate of teachers in SWAYAM-MOOCs in the central universities of North East India.
- The findings showed that among the teacher respondents, a higher number of arts teachers enrolled in MOOCs than sciences teachers. It was also found that a higher number of male teachers enrolled in MOOCs than their female counterparts. Furthermore, teachers with above ten years of teaching experience (32.8%) enrolled in MOOCs in higher number than their counterpart with below ten years of teaching experience (9.4%).

- Additionally, 23.4% (15 out of the 64 teacher respondents) were found to obtain their online learning completion certificate.

B.) Qualitative Findings

vi.) Findings related to the status of MOOCs at Mizoram University, Nagaland University, North Eastern Hill University, and Manipur University

a.) Status of MOOCs in Mizoram University

- Despite the increased awareness of Massive Open Online Courses (MOOCs) within the institution, feedback on Mizoram University's status as a Host Institution was assessed as fairly satisfactory, with scope for further improvement.
- In 2018, Ministry of Education, Government of India, sanctioned a National Resource Centre to the Department of Education, Mizoram University, for the development of MOOC courses under the Pandit Madan Mohan Malavya National Mission on Teachers and Teaching (PMMMNTT) for the Annual Refresher Programme in Teaching (ARPIT). Under this initiative, the Department developed 40 modules on Research Methodology in Education, which were uploaded on the SWAYAM platform as a non-credit MOOC course.
- However, based on interview data, participants perceived several shortcomings in essential infrastructure, particularly the lack of dedicated facilities, inadequate recording studio provisions, and a shortage of trained staff to manage MOOC operations and course delivery. Additionally, interview evidence indicated that the university had not offered any MOOC credit courses under SWAYAM through its faculty and relied primarily on external platforms.
- In response to these challenges, the minutes of the 48th meeting of the Academic Council, AC:47:4(17) recorded a resolution approving the introduction of a SWAYAM Course as a compulsory paper in place of the Interdisciplinary Minor (IMN) course across both semesters, effective from

the 2025-26 Academic Session. The course was approved to carry two credits, as noted by the respondent.

b.) Status of MOOCs in Nagaland University

- Interview data indicated that the status of SWAYAM-MOOCs at Nagaland University was perceived as unsatisfactory.
- Participants reported that the university did not function as a Host Institution for offering MOOC courses through the SWAYAM platform. Interview evidence further suggested the absence of dedicated infrastructure, such as recording studios or specialized facilities, which are considered essential for the effective management and implementation of MOOC operations.
- In addition, participants indicated that the university had not offered any MOOC courses under SWAYAM through its own faculty and relied primarily on external platforms.
- Respondents also stated that students were encouraged to enroll in courses available on the SWAYAM-MOOCs portal for online learning, which had been operational for approximately four years. However, despite such encouragement, student participation remained limited. Regarding enrollment patterns, respondents indicated that approximately fifty-five students typically registered on the SWAYAM portal during their third and fourth semesters.

c.) Status of MOOCs in North Eastern Hill University

- Interview data indicated that the status of North-Eastern Hill University was assessed as moderately satisfactory as they had established the necessary provisions for functioning as a Host Institution for SWAYAM-MOOCs since the 2022-23 academic years.
- These provisions included essential infrastructure such as recording studios, equipment, facilities, and support personnel for the effective implementation and operation of MOOC courses.
- The university was at the initial stage of providing and delivery of MOOC courses. However, when asked about student enrollment in MOOCs,

respondents were unable to provide precise figures, as MOOCs related activities were managed independently by different departments.

- With regard to the number of MOOC courses offered, respondents noted that only two courses had been planned for introduction under the SWAYAM-MOOCs framework.
- Additionally, respondents further commented that the availability of additional courses would depend on curriculum development processes, while the specific courses offered would be influenced by faculty areas of specialization, emphasizing the nature and number of MOOC courses may vary across departments.

d.) Status of MOOCs in Manipur University

- Interview data indicated that the growth of Massive Open Online Courses (MOOCs), particularly SWAYAM-MOOCs, at Manipur University reflected a strong institutional commitment to the initiative and was assessed as highly satisfactory.
- Participants reported that the university functioned as a Host Institution for offering SWAYAM-MOOC courses through the Educational Multimedia Research Centre (EMMRC), one of the twenty-two media centres established on campus by the University Grants Commission.
- The availability of well-developed facilities, including recording studios, infrastructure, faculty expertise, and support personnel, was perceived to have effectively supported the implementation, management, and operation of MOOC courses.
- An interview with the MOOC Coordinator revealed that student enrolment in the SWAYAM-MOOCs offered through the Educational Multimedia Research Centre (EMMRC) had exceeded 100,000 learners. Moreover, respondents reported that the university had actively contributed to MOOC development, having launched a total of 78 courses under the SWAYAM platform as of January 2024.
- Furthermore, interview evidence suggested that the design, development, and delivery of MOOC courses at Manipur University were aligned with UGC

Credit Framework for Online Learning Courses through SWAYAM Regulations (2016) and the SWAYAM Guidelines (2017).

11.2. Findings related to Objective 2:

Objective No.2: To examine the plans and programmes formulated by the central universities of North East India to implement MOOCs in their university.

11.2.1. Mizoram University

- In the case of Mizoram University, information related to MOOC implementation was obtained from the Academic and Conference Section of the university. Documentary evidence indicated that during the 31st meeting of the Academic Council held on 25th November 2016, the Council resolved to approve the implementation of the *UGC-Credit Framework for Online Learning Courses through SWAYAM, Regulations, 2016*, with effect from the subsequent academic session. Furthermore, the minutes of the 33rd meeting of the Academic Council held on 7th December 2017, with reference to the meeting minutes page 22, AC:33:4(11), recorded approval, in principle, for the introduction of Massive Open Online Courses (MOOCs) in undergraduate and postgraduate programmes, subject to certain modifications discussed during the meeting. The resolution proposed that a minimum of two MOOCs be made compulsory, preferably in the second and third semesters, with credit limits specified under the Choice Based Credit System (CBCS). Regarding credits, it should not be more than 2 credits (for 6 months course) and 4 credits (for 1 year course), with a minimum of 4 credits and a maximum of 8 credits, be given in addition to the regular credits under CBCS specified for the particular course.
- Interview data suggested that although policy approval was granted earlier, full-fledge adoption and integration of MOOCs commenced from the 2025 academic session. Respondents indicated that postgraduate programmes across nine schools of the university had registered for SWAYAM courses during this period.

- Regarding plans and programs, the Faculty Development Centre, under the School of Education, had conducted two workshops on designing and developing MOOC courses. Similarly, the School of Education at Mizoram University had conducted a seminar on MOOC design, development, and delivery in collaboration with National Institute of Educational Planning and Administration (NIEPA).
- With regard to capacity-building initiatives, respondents reported that the Faculty Development Centre under the School of Education had conducted two workshops on the design and development of MOOC courses. In addition, the School of Education organized a seminar on MOOC design, development and delivery in collaboration with the National Institute of Educational Planning and Administration (NIEPA).
- Furthermore, during interviews with the Head of the Department of Education, reference was made to the establishment of a National Resource Centre under Pandit Madan Mohan Malivya National Mission on Teachers and Teaching (PMMMNM TT). Respondents noted that the centre had developed forty videos and forty e-learning materials for a non-credit MOOC course under the Annual Refresher Programme in Teaching (ARPIT) for in-service higher education teachers, administered by the Ministry of Education, Government of India.

11.2.2. Nagaland University

- In the case of Nagaland University, interview data suggested that the university was not functioning as a Host Institution for MOOCs at the time of the study, which limited the scope for full-fledge implementation. However, respondents indicated that preliminary planning was underway to enable students to enroll in MOOC courses in the near future. According to one respondent, the immediate institutional plan focused on raising student awareness of MOOCs through regular seminars conducted four times a year – twice per semester.

- Additionally, it is worth noting that university officials had initiated seminars and workshops to formulate long-term strategies for MOOC implementation. Despite the absence of studio facilities, dedicated infrastructure, and trained personnel or staff members, respondents reported that efforts were made to familiarize students with MOOCs by facilitating their registration on the SWAYAM portal.

11.2.3. North Eastern Hill University

- Interview data suggested that MOOCs were formally introduced at North-Eastern Hill University during the 2022-2023 academic years, preliminary discussions and planning had begun prior the Covid-19 lockdown in 2020. Respondents reported that efforts were underway to establish the university as a Host Institution, and a dedicated studio for MOOC development had been set up, along with the necessary infrastructure, staff, and other personnel for recording and reviewing course content.
- Participants reported that the Department of Science was among the first to begin recording and offering MOOC courses, while other departments, including the Department of Education, were in various stages of development. At the time of data collection, respondents noted that the Department of Education was in the process of developing its first two SWAYAM courses and had yet to officially offer MOOCs. In contrast, other departments had begun running their respective programs.
- Regarding student sensitization strategies, respondents reported that initiatives were taken to inform students about MOOCs during orientation, emphasizing the opportunity to earn additional credits. Regular updates were also provided at the beginning of each academic year. Furthermore, programs such as seminars and conferences related to MOOC awareness were also conducted. Measures had also been taken to include teachers in this regard, through initiatives such as faculty workshops, as well as encouraging them to enroll in online courses to promote MOOCs and for better understanding. Consequently, respondents further commented that a total of fourteen

seminars, workshops, and faculty training programmes had been organized to date. However, precise data on student enrollment across departments were not readily available.

11.2.4. Manipur University

- Data collected through interview evidence reported that Manipur University had established a comparatively advanced framework for MOOC implementation through the Educational Multimedia Research Centre (EMMRC). Respondents reported that the university possessed well developed infrastructure, including a dedicated building for MOOCs, recording studios, recording gadgets, and specialized personnel such as MOOC faculty members, subject experts, presenters, editors, and production teams. Participants also indicated that faculty members from other universities collaborated in the development of MOOC materials.
- Respondents further reported that workshops and seminars were regularly organized to create awareness among faculty members and students, ensuring adherence to University Grants Commission guidelines. Although the university had already launched several MOOC initiatives, respondents indicated that further expansion was contingent upon the availability of additional funding, which was viewed as essential for sustaining and scaling MOOC development.
- In addition, interview data suggested that the MOOC Coordinator had conducted lectures and training session on the integration of technology in education, MOOC development processes, and compliance with regulatory requirements, including proposal submission, expert review, and alignment with UGC standards. Despite the impressive initiatives already taken at the university, respondents emphasized the need for further improvements in staff organization, course availability, credit transfer mechanisms, and alignment with Ministry of Education guidelines.

11.3. Findings related to Objective 3:

Objective No.3: To reveal issues in connection with the design, development, and implementation of MOOCs in central universities of North East India.

11.3.1. Issues with the Designing of MOOCs

- All the 64 teacher respondents (100%) were found to be aware of the MOOC courses.
- However, majority (92.2%) had neither prepared nor created MOOCs and had not received any training for designing and developing MOOCs, respectively.
- This indicated a significant gap between the awareness level of MOOCs and the actual involvement of teachers due to a lack of institutional support.
- Majority, 85.9% had reported the lack of institutional support staff for developing and providing MOOCs, while only 14.1% reported having the required supporting staff for designing and developing MOOCs.
- Thus, the findings revealed a high level of theoretical awareness about MOOC courses, but a very low level of actual participation, involvement, training and institutional support for the proper and smooth operation of MOOCs among teachers.

11.3.2. Issues with the Development of MOOCs

- The findings showed that one major significant issue reported by the teacher respondents is the lack of necessary infrastructural equipment for developing MOOCs as per the UGC Regulations 2016.
- Majority (90.6%) of respondents indicated inadequate institutional infrastructure for running MOOCs, and 89.1% confirmed that MOOCs are not integrated as regular courses.
- Furthermore, the absence of skill-based offerings on SWAYAM and low student enrollment is another significant challenge, with 89.1% of teacher respondents reporting issues.

- Additionally, 87.5% reported that available MOOCs fail to incorporate essential components like e-tutorials, e-content, discussion forums, and assessments, compounded by a lack of dedicated staff for course development, leading faculty to rely directly on SWAYAM portal registrations.

11.3.3. Issues with the Implementation of MOOCs

- Although the University Grants Commission has given clear cut direction to the universities to implement MOOCs, one of the major significant challenges reported is host institution.
- Majority (92.7%) of the respondents stated that their institutions were not directly involved in hosting and delivery of MOOC courses and conducting examination.

Qualitative Insights:

It was evident that the measures implemented so far regarding MOOCs in central universities of North East India left much to be desired. At the time of data collection for the study, i.e, six to seven years after the UGC has laid down the *Credit Framework for Online Learning Courses through SWAYAM Regulations* (2016), it seemed to be a challenging initiative for the universities.

Although awareness of MOOCs was widely prevalent, widespread satisfactory integration is yet to be seen. The fundamental issue regarding MOOCs in these universities was this significant gap between knowing about MOOCs and its active practice or adoption. MOOCs have not yet been integrated enough to generate issues that were worth studying in depth. Additionally, there was also a significant gap among the universities in terms of MOOCs implementation, ranging from initial stage meetings to full swing adoption offering variety of courses.

There was a general lack of supporting staff at the institution level as well as training initiatives for designing, developing and providing MOOCs courses, resulting in a significant lack of teacher participation in creating these courses. Moreover, the institutions were not equipped with necessary infrastructure to run

MOOC course, this was reflected by the fact that majority of the institution not offering a regular MOOC course. Further, majority of the universities were also not host institutes and therefore were not directly involved in hosting and delivery of MOOC courses and conducting examination. This had led to problems in finding out issues relating to MOOCs implementation, as majority of the questions regarding implementation issues were met with negative responses due to lack of implementation, and the revealed issues were only from the few universities that actually implement MOOCs.

Students' enrolment in SWAYAM-MOOC was also not satisfactory, and there was a lack of proper feedback mechanism for MOOCs from the student, both of which might be due to lack of awareness about MOOCs on the students' part. Further concern noted was time constraint. For universities with no supporting staff from affiliated colleges, it was difficult for teachers to make time for MOOCs efforts on top of their regular teaching workload. Moreover, the recording process for MOOCs courses was also a challenge, as teachers were not used to present in front of cameras for recorded courses without proper training and practice.

Moreover, evaluation system was carried out by the National Testing Agency (NTA), making it difficult to track how many students completed their courses and received certificates based on institution, as it was an online format and students from various institutions participated.

Concerns regarding academic integrity and accountability in terms of students learning and examination process were also expressed, and a push for enhanced funding to facilitate more MOOC courses was also noted.

11.4. Findings related to Objective 4:

Objective No.4: To assess university students' perceptions of learning through MOOCs.

11.4.1. Responses and Opinions of Students having no prior knowledge of MOOCs

- Out of 320 student respondents, 21.3% of the students found MOOCs to be interesting and helpful, respectively.

- 13.7% and 13.3%, students opined that MOOCs were encouraging and important, respectively, for further studies and knowledge acquisition.
- However, a small number of students found MOOCs to be challenging (8.4%) and confusing (5.6%).
- 4% of the respondents reported that MOOCs changed their view towards online learning, 3.6% found it difficult, and 2.4% believed that it is stimulating.
- The remaining small fractions of the respondents opined that MOOCs were thought-provoking (1.8%), irrelevant (0.6%), off-putting (0.6%), and scary (0.8%).

11.4.2. Responses and Opinions of Students who are actively engaged in MOOCs

- The enrolled students who had knowledge and experience opined MOOCs to be very helpful (21.7%) for complementing their studies.
- Additionally, 19% and 15% of the enrolled students perceived MOOCs as interesting and important, respectively.
- 9.3% and 8.8% opined that MOOCs were both encouraging and challenging, respectively.
- 7.1% of the respondents reported that MOOCs changed their views toward online learning.
- 5.3% found it difficult, and the remaining small numbers opined that MOOCs were stimulating (3.1%), boring (3.1%), and thought-provoking (3.1%).
- 2.6% of the students found it confusing, while the remaining opined that MOOCs were irrelevant (0.9%) and off-putting (0.9%)

11.5. Findings related to Objective 5:

Objective No.5: To compare university students' perceptions of learning through MOOCs with respect to gender and streams of study.

11.5.1. Comparisons of Students' Perceptions in relation to MOOCs with respect to Gender

1. Motivation:

- The computed chi-square value of 0.74 is less than the critical chi-square value of 5.991, with degrees of freedom = 2 at 0.05 level of significance. Hence, it is said to be non-significant.
- Consequently, the null hypothesis, which states, *'there is no significant difference in the perception of learning motivation on MOOCs between male and female students in the central universities of North East India,'* cannot be rejected.
- Hence, the null hypothesis (H_{01}) was accepted.

2. Perceived Importance:

- The computed chi-square value of 3.19 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis stating *'there is no significant difference in the perception of the importance of learning through MOOCs between male and female students in the central universities of North East India'* cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived importance of learning through MOOCs by male and female students.
- Hence, the null hypothesis (H_{02}) was accepted.

3. Perceived Benefits:

- The computed chi-square value of 1.10 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance.
- Thus, it is said to be non-significant, and therefore, the null hypothesis, which states '*there is no significant difference in the perception of the benefits of learning through MOOCs between male and female students in the central universities of North East India,*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived benefits of learning through MOOCs between male and female students.
- Hence, the null hypothesis (H_{03}) was accepted.

4. Learning Expectations:

- The computed chi-square value of 2.63 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis, which states '*there is no significant difference in the perception of learning expectations of MOOCs between male and female students in the central universities of North East India,*' cannot be rejected. Therefore, it can be concluded that there is no significant difference in the perceived learning expectations of MOOCs between male and female students.
- Hence, the null hypothesis (H_{04}) was accepted.

5. Perceived Challenges:

- The computed chi-square value of 3.11, presented in Table 4.23, is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Therefore, the null hypothesis, which states '*there is no significant difference in the perception of the learning challenges through MOOCs between male*

and female students in the central universities of North East India,’ cannot be rejected. Consequently, there is no significant difference in the perceived learning challenges through MOOCs between male and female students.

- Hence, the null hypothesis (H_{05}) was accepted.

11.5.2. Comparisons of Students Perceptions in relation to MOOCs with respect to Streams of Study

1. Motivation:

- The computed chi-square value of 1.11 is much less than the critical chi-square value of 5.991, with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis, which states, *‘there is no significant difference in the perception of learning motivation on MOOCs between arts and sciences students of the central universities of North East India,’* cannot be rejected as there is no significant difference between the perception of arts and sciences students in their motivation to learn on MOOCs.
- Hence, the null hypothesis (H_{06}) was accepted.

2. Perceived Importance:

- The computed chi-square value of 0.50 is much less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Therefore, the null hypothesis stating *‘there is no significant difference in the perception of the importance of learning through MOOCs between arts and sciences students of the central universities of North East India’* cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived importance of learning through MOOCs by students from the arts and sciences streams.
- Hence, the null hypothesis (H_{07}) was accepted.

3. Perceived Benefits:

- The computed chi-square value of 0.42 is much less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Thus, it is said to be non-significant.
- Therefore, the null hypothesis, which states that '*there is no significant difference in the perception of the benefits of learning through MOOCs between arts and sciences students of the central universities of North East India,*' cannot be rejected. Consequently, it is concluded that there is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences students.
- Hence, the null hypothesis (H_{08}) was accepted.

4. Learning Expectations:

- The computed chi-square value of 1.68 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis, which states '*there is no significant difference in the perception of learning expectations of MOOCs between the arts and sciences stream,*' cannot be rejected. Therefore, it can be concluded that there is no significant difference in the perceived learning expectations of MOOCs between students from the arts and sciences streams.
- Hence, the null hypothesis (H_{09}) was accepted.

5. Perceived Challenges:

- The computed chi-square value of 3.42 is less than the critical chi-square value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis, which states '*there is no significant difference in the perception of the learning challenges through MOOCs between the streams of arts and sciences,*' cannot be rejected. Consequently, there is no

significant difference in the perceived learning challenges through MOOCs between the students from the arts and sciences stream.

- Hence, the null hypothesis (H_{010}) was accepted.

Qualitative Insights: The analysis of students' perceptions of MOOCs across gender and streams of study in central universities of North East India revealed a high degree of consistency. Quantitative results showed no statistically significant differences in any of the five dimensions namely - motivation, perceived importance, perceived benefits, learning expectations, or perceived challenges based on either gender or streams of study. These findings are strongly corroborated by qualitative insights from focus group discussions, where students across all groups expressed similar motivations, benefits, expectations, and challenges. Both male and female students, as well as those from arts and sciences backgrounds, emphasized the role of teacher encouragement, self-paced learning, and personal development in motivating MOOC engagement. They uniformly recognized the value of MOOCs in enhancing academic and professional readiness, appreciated the accessibility and affordability of content. At the same time, shared challenges such as unreliable internet connectivity and difficulty managing assignment deadlines were consistently reported.

11.6. Findings related to Objective 6:

Objective No. 6: To assess the perceptions of university teachers of central universities of North East India on MOOCs' pedagogy and learning design.

11.6.1. Responses and Opinions of Teachers towards MOOCs

- Out of 64 teacher respondents, 18.3% of teachers perceived MOOCs as 'Challenging.'
- 16.3% and 15.9% of teachers opined MOOCs as 'interesting' and 'helpful' for knowledge enhancement, respectively.
- 13.6% of the respondents perceived MOOCs as 'important' for further upskilling and boosting their confidence in online learning courses.

- 10.8%, 10.4% and 9.1% of the teacher respondents opined MOOCs as ‘difficult’ and ‘encouraging’ for knowledge development, and these online learning courses ‘changed their view’ with regard to the digital learning innovation, respectively.
- On the contrary, only a few of the teachers opined MOOCs as confusing (4%) and thought-provoking (1.5%)

Qualitative Insights: Teacher’s respondents further commented on their perception of MOOCs. MOOCs were perceived as challenging as they increased the workload and activities of teachers beyond the regular classroom teaching-learning process, as stated by one respondent. Some teachers have opined that MOOCs are interesting due to their innovations to promote digital learning and technology integration across all levels of education, as per the NEP 2020. One respondent further commented that MOOCs will be helpful in the near future in enhancing teaching, enabling personalized learning, and ensuring equitable access to quality education even for the most disadvantaged, which meets the needs globally and locally.

On the contrary, some respondents opined that MOOCs were difficult because they required skills, digital literacy, and knowledge to properly operate technological facilities such as cameras, recorders, and uploading materials online, among other things, for the smooth delivery and offering of MOOCs. Consequently, to acquire digital literacy and technological knowledge, teachers were expected and required to train in such areas, which increases the workload and activities of the teachers. At the same time, some teachers opined that MOOCs are encouraging as they provide an opportunity to enhance their knowledge of trending digital literacy and technological knowledge, and keep them updated concerning the integration and incorporation of technologies in the modern educational system.

11.7. Findings related to Objective 7:

Objective No.7: To compare university teachers' perceptions of MOOCs' pedagogy and learning design with respect to gender, streams of study, and teaching experiences.

11.7.1. Comparisons of Teachers' Perceptions of MOOCs with respect to Gender

1. Motivation for Learning:

- The computed chi-square value 4.08 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. This indicates that the result is statistically non-significant.
- Therefore, the null hypothesis (H_{011}), which states that "*there is no significant difference in the perception of motivation for learning in MOOCs between male and female teachers in central universities of North East India,*" cannot be rejected.
- Hence, the null hypothesis (H_{011}) was accepted.

2. Perceived Benefits:

- The calculated chi-square value 13.91 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance.
- Therefore, the difference in the perception of male and female teachers regarding the benefits of learning through MOOCs is statistically significant.
- Consequently, the null hypothesis (H_{012}) stating that "*there is no significant difference in the perceived benefits of learning through MOOCs between male and female teachers in central universities of North East India*" was rejected.
- Hence, it was concluded that female teachers perceived significantly greater benefits of MOOCs compared to their male counterparts.

3. Learning Challenges:

- The computed chi-square value of 11.33 is greater than the critical value of 5.991 with $df = 2$ at 0.05 level of significance.
- This outcome indicated a statistically significant difference in perceptions of learning challenges between male and female teachers.
- As a result, the null hypothesis (H_{013}), “*there is no significant difference in teachers’ perception of MOOCs’ learning challenges with respect to gender*” was rejected.
- Therefore, it can be concluded that gender plays a role in shaping teachers’ perceptions of the challenges posed by MOOCs in the central universities of North East India.

4. Learning Design:

- The computed chi-square value 7.40 is greater than the critical value of 5.991 with $df = 2$ at 0.05 level of significance.
- Hence, there is a statistically significant difference in perceptions of learning design of MOOCs based on gender.
- Consequently, the null hypothesis (H_{020}), which stated, “*There is no significant difference in the perception of MOOC learning design between male and female teachers,*” was rejected.
- The study revealed that while both male and female teachers largely agreed on the effectiveness of MOOC learning design, a relatively higher proportion of male teachers expressed disagreement or uncertainty compared to their female counterparts.

5. Development and Implementation:

- The computed chi-square value 10.11 is greater than the critical chi-square value of 5.991 with $df = 2$ at the 0.05 level of significance.
- This result indicated a statistically significant difference between male and female teachers’ perceptions.

- Thus, the null hypothesis (H_{021}), which stated that “*there is no significant difference in the perception of development and implementation of learning on MOOCs between male and female teachers in central universities of North East India,*” was rejected.
- The findings revealed that while both groups responded positively, female teachers reported a higher level of agreement, with substantially fewer instances of disagreement compared to their male counterparts

11.7.2. Comparisons of Teachers’ Perceptions of MOOCs with respect to Streams of Study

1. Motivation for Learning:

- The computed chi-square value 4.08 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. Therefore, the result is statistically non-significant.
- Consequently, the null hypothesis (H_{014}), which states, “*there is no significant difference in the perception of motivation for learning in MOOCs between teachers across the arts and sciences streams in central universities of North East India,*” was accepted.
- The findings indicated that arts and science teachers exhibit similar levels of motivation for learning through MOOCs.

2. Perceived Benefits:

- The computed chi-square value was found to be 2.77, which is lesser than the critical table value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is considered statistically non-significant.
- Consequently, the null hypothesis (H_{015}) which states that “*there is no significant difference in the perceived benefits of learning through MOOCs between arts and sciences teachers in central universities of North East India,*” cannot be rejected.

- This result of the study showed that no significant difference exists in the perceived benefits of learning through MOOCs between arts and sciences teachers.
- Furthermore, the findings indicated that a majority of teachers from both streams agreed on the benefits of MOOCs for teaching and learning.
- Hence, the null hypothesis (H_{015}) was accepted.

3. Learning Challenges:

- The computed chi-square value 6.03 is greater than the critical value 5.991 with $df = 2$ at the 0.05 level of significance. This indicated a statistically significant difference between the arts and sciences teachers with respect to their perception of learning challenges in MOOCs.
- Consequently, the null hypothesis (H_{016}), which stated that “*there is no significant difference in the perceived learning challenges of MOOCs between teachers across arts and science streams in central universities of North East India,*” was rejected.
- The findings of the study showed that while both groups acknowledged the existence of challenges, arts teachers had a noticeably higher proportion of undecided responses compared to science teachers, who showed stronger agreement.

4. Learning Design:

- The computed chi-square value 6.49 is greater than the critical value of 5.991 with $df = 2$ at the 0.05 level of significance. This indicates a statistically significant difference in the perceptions of learning design between arts and science teachers.
- Therefore, the null hypothesis (H_{022}), which stated that, “*There is no significant difference in the perception of learning design between arts and sciences teachers in central universities of North East India,*” was rejected.

- The findings of the study showed that while agreement was high in both streams, differences in patterns emerged, with science teachers showing a higher proportion of agreement, whereas arts teachers reported a relatively larger share of undecided responses.

5. Development and Implementation:

- The computed chi-square value 2.06 is less than the critical chi-square value of 5.991 with $df = 2$ at the 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis (H_{023}), which states that, *“there is no significant difference in perception of MOOC development and implementation between teachers across arts and science streams in central universities of North East India,”* cannot be rejected.
- The findings showed that both streams showed relatively similar proportions of agreement, disagreement, and undecided responses.
- Hence, the null hypothesis (H_{023}) was accepted.

11.7.3. Comparisons of Teachers’ Perceptions of MOOCs with respect to Teaching Experiences

1. Motivation for Learning:

- The computed chi-square value 3.05 is less than the critical value 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is said to be non-significant.
- Therefore, the null hypothesis (H_{017}), which stated that *“there is no significant difference in the perception of motivation for learning in MOOCs between teachers with above ten years of teaching experience and those with below ten years,”* was accepted.
- The findings of the study showed that both groups, teachers with less than ten years of experience and those with more than ten years, highly agreed that MOOCs serve as an important source of learning motivation.

2. Perceived Benefits:

- The computed chi-square value 12.16 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance.
- This indicates a statistically significant difference in perceptions between teaching experience and benefits of learning through MOOCs.
- Consequently, the null hypothesis (H_{018}), which states that “*There is no significant difference in the perception of the benefits of learning through MOOCs between teachers with above and below ten years of teaching experience,*” was rejected.
- The findings revealed that teachers with less than ten years of experience overwhelmingly agreed on the benefits, with only a small number undecided. In contrast, teachers with more than ten years of experience showed relatively lower levels of agreement, with a greater proportion expressing disagreement or uncertainty compared to their junior counterparts.

3. Learning Challenges:

- The computed chi-square value 12.11 is greater than the critical value 5.991 with $df = 2$ at 0.05 level of significance.
- This indicates a statistically significant difference between teaching experience and perceptions of MOOC-related learning challenges.
- Therefore, the null hypothesis (H_{019}), which stated, “*There is no significant difference in the perception of learning challenges through MOOCs with respect to teaching experiences,*” was rejected.
- The findings of the study revealed that teachers with less than ten years of experience showed a higher proportion of undecided responses, whereas teachers with more than ten years of experience expressed stronger agreement that MOOCs involve significant learning challenges.

4. Learning Design:

- The computed chi-square value 2.39 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. Hence, it is non-significant.
- Consequently, the null hypothesis (H_{024}), which states, “*there is no significant difference in the perceived learning design of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India,*” was accepted.
- The study showed that both groups, teachers with less than ten years and those with more than ten years of teaching expressed high levels of agreement about the effectiveness of MOOC learning design, with only slight variations in the proportions of disagreement and undecided responses..

5. Development and Implementation:

- The computed chi-square value 4.44 is less than the critical value of 5.991 with $df = 2$ at 0.05 level of significance. This indicates no statistically significant difference.
- Therefore, the null hypothesis (H_{025}), which states “*there is no significant difference in the perception of the development and implementation of MOOCs between teachers with ten years above and ten years below teaching experience in central universities of North East India,*” was accepted.
- The findings of the study revealed that although both groups, teachers with less than ten years and those with more than ten years of experience expressed strong agreement on the value of MOOCs, minor differences emerge: relatively more senior teachers expressed disagreement compared to junior faculty, who were more inclined to remain undecided.

Qualitative Insights: The teachers in central university of North East India exhibited generally positive perceptions of MOOCs’ pedagogical value and learning design effectiveness across gender, streams of study, and teaching experience. The study revealed that female teachers, science teachers, and teachers below ten years of teaching experiences expressed stronger optimism and adaptability toward MOOCs.

On the contrary, it was also found that male teachers, arts teachers, and teachers having more than ten years of teaching experiences highlighted more pragmatic challenges mainly infrastructural, institutional, and sustainability-related.

The overall findings of the study revealed a consistent appreciation for MOOCs as transformative tools for higher education, tempered by contextual challenges of technology integration, learner engagement, and institutional recognition.

12. DISCUSSION AND SUGGESTION FOR FURTHER RESEARCH

12.1. Discussions on the Major Findings of the Study

The study undertook a comprehensive analysis of Massive Open Online Courses (MOOCs) across four central universities of North East India: Mizoram University (MZU), Nagaland University (NU), North-Eastern Hill University (NEHU) and Manipur University (MU). Through a mixed-methods approach encompassing both quantitative surveys and qualitative interviews, the study explores the current status, problems and perceptions of MOOCs among stakeholders (students and teachers) within these central universities. This discussion synthesizes the empirical findings from Chapter-IV in relation to the existing literature, policy frameworks and the socio-educational context of the North Eastern region to address the study's seven research objectives.

12.1.1. Status of MOOCs: Awareness, Enrolment and Institutional Readiness

The findings of the study revealed that more than half (61.6%) of the surveyed students in the central universities of North East India were found to be aware of MOOCs. The results of the study showed that the students from arts (60.9%) were found to be more aware of MOOCs than sciences students (39.1%), and that female students (57.9%) were more aware of MOOCs than their male (42.1%) counterparts. Concerning the enrolment rate of students in online learning platform, the study revealed that only few students, 65 (20.3%) out of the 320 surveyed students had enrolled in MOOCs suggesting a low enrollment rate of students in SWAYAM-MOOCs in the central universities of North East India.

Among the 61.6% (197 students) who have awareness of MOOCs, 46.7% (92 students) identified teachers as the primary source of information regarding MOOCs. This highlights the pivotal role of teachers in promoting students' awareness of the importance, benefits, and potential career opportunities associated with MOOCs within the educational environment.

Concerning teachers awareness and experiences of MOOCs, the results showed that all the 64 teachers surveyed (100%) in the central universities of North East India were aware of MOOCs. However, out of the 64 teacher respondents, it was found that few teachers with 42.2% (27) had enrolled in MOOCs, suggesting that despite the widespread awareness of MOOCs, there was a low enrolment rate of teachers in SWAYAM-MOOCs in the central universities of North East India. Moreover, the findings showed that among the teacher respondents, a higher number of arts teachers (25%) enrolled in MOOCs than sciences teachers (17.2%). It was also found that a higher number of male teachers (29.7%) enrolled in MOOCs than their female (12.5%) counterparts. Furthermore, teachers with above ten years of teaching experience (32.8%) enrolled in MOOCs in higher number than their counterpart with below ten years of teaching experience (9.4%). Additionally, only few teachers with 23.4% (15 out of the 64 teacher respondents) were found to obtain their online learning completion certificate.

Despite the increased awareness of Massive Open Online Courses (MOOCs) within the institution, feedback on the status of Mizoram University as a Host Institution was assessed as fairly satisfactory, with scope for further improvement. Interview evidence indicated that the university had not offered any MOOC credit courses under SWAYAM through its faculty and relied primarily on external platforms. However, documentary evidence indicated that the minutes of the 48th meeting of the Academic Council, AC:47:4(17) recorded a resolution approving the introduction of a SWAYAM Course as a compulsory paper in place of the Interdisciplinary Minor (IMN) course across both semesters, effective from the 2025-26 Academic Session. The course was approved to carry two credits and that

postgraduate programmes across nine schools of the university had registered for SWAYAM courses during this period, as noted by the respondent.

In a comparable but less successful vein, interview data indicated that the status of SWAYAM-MOOCs at Nagaland University was perceived as unsatisfactory. In addition, participants indicated that the university had not offered any MOOC courses under SWAYAM through its own faculty and relied primarily on external platforms. Nonetheless, it is worth noting that university officials had initiated seminars and workshops to formulate long-term strategies for MOOC implementation. Despite the absence of studio facilities, dedicated infrastructure, and trained personnel or staff members, it was reported that efforts were made to familiarize students with MOOCs by facilitating their registration on the SWAYAM portal. It was also stated that students were encouraged to enroll in courses available on the SWAYAM-MOOCs portal for online learning, which had been operational for approximately four years. However, despite such encouragement, student participation remained limited.

On the contrary, interview data indicated that the status of North-Eastern Hill University was assessed as moderately satisfactory as they had established the necessary provisions for functioning as a Host Institution for SWAYAM-MOOCs since the 2022-23 academic years. These provisions included essential infrastructure such as recording studios, equipment, facilities, and support personnel for the effective implementation and operation of MOOC courses. The university was at the initial stage of providing and delivery of MOOC courses. Respondents further commented that a total of fourteen seminars, workshops, and faculty training programmes had been organized to date.

Ultimately, interview data indicated that the growth of Massive Open Online Courses (MOOCs), particularly SWAYAM-MOOCs, at Manipur University reflected a strong institutional commitment to the initiative and was assessed as highly satisfactory. Participants reported that the university functioned as a Host Institution for offering SWAYAM-MOOC courses through the Educational Multimedia Research Centre (EMMRC), one of the twenty-two media centres

established on campus by the University Grants Commission. Respondents reported that the university possessed well developed infrastructure, including a dedicated building for MOOCs, recording studios, recording gadgets, and specialized personnel such as MOOC faculty members, subject experts, presenters, editors, and production teams. Participants also indicated that faculty members from other universities collaborated in the development of MOOC materials. Moreover, it was reported that the university had actively contributed to MOOC development, having launched a total of 78 courses under the SWAYAM platform as of January 2024.

12.1.2. Issues with MOOCs Adoption: Infrastructure, Motivation and Institutional Support

It was evident that the measures implemented so far regarding MOOCs in central universities of North East India left much to be desired. At the time of data collection for the study, i.e, six to seven years after the UGC has laid down the *Credit Framework for Online Learning Courses through SWAYAM Regulations* (2016), it seemed to be a challenging initiative for the universities.

Although awareness of MOOCs was widely prevalent, widespread satisfactory integration is yet to be seen. The fundamental issue regarding MOOCs in these universities was this significant gap between knowing about MOOCs and its active practice or adoption. MOOCs have not yet been integrated enough to generate issues that were worth studying in depth. Additionally, there was also a significant gap among the universities in terms of MOOCs implementation, ranging from initial stage meetings to full swing adoption offering variety of courses.

There was a general lack of supporting staff at the institution level as well as training initiatives for designing, developing and providing MOOCs courses, resulting in a significant lack of teacher participation in creating these courses. Moreover, the institutions were not equipped with necessary infrastructure to run MOOC course, this was reflected by the fact that majority of the institution not offering a regular MOOC course. Further, majority of the universities were also not host institutes and therefore were not directly involved in hosting and delivery of MOOC courses and conducting examination. This had led to problems in finding out

issues relating to MOOCs implementation, as majority of the questions regarding implementation issues were met with negative responses due to lack of implementation, and the revealed issues were only from the few universities that actually implement MOOCs.

Students' enrolment in SWAYAM-MOOC was also not satisfactory, and there was a lack of proper feedback mechanism for MOOCs from the student, both of which might be due to lack of awareness about MOOCs on the students' part.

Further concern noted was time constraint. For universities with no supporting staff from affiliated colleges, it was difficult for teachers to make time for MOOCs efforts on top of their regular teaching workload. Moreover, the recording process for MOOCs courses was also a challenge, as teachers were not used to present in front of cameras for recorded courses without proper training and practice.

Moreover, evaluation system was carried out by the National Testing Agency (NTA), making it difficult to track how many students completed their courses and received certificates based on institution, as it was an online format and students from various institutions participated.

Concerns regarding academic integrity and accountability in terms of students learning and examination process were also expressed, and a push for enhanced funding to facilitate more MOOC courses was also noted.

12.1.3. University Students' Perceptions of Learning through MOOCs with respect to Gender and Streams of Study in Central University of North East India.

The analysis of students' perceptions of learning through MOOCs with respect to gender and streams of study in central universities of North East India revealed a high degree of consistency. Quantitative results showed no statistically significant differences in any of the five dimensions namely - motivation, perceived importance, perceived benefits, learning expectations, or perceived challenges based on either gender or streams of study. These findings were strongly corroborated by qualitative insights from focus group discussions, where students across all groups

expressed similar motivations, benefits, expectations, and challenges. The study revealed that both male and female students, as well as those from arts and sciences backgrounds, emphasized the role of teacher encouragement, self-paced learning, and personal development in motivating MOOC engagement. They uniformly recognized the value of MOOCs in enhancing academic and professional readiness, appreciated the accessibility and affordability of content. Moreover, shared challenges such as unreliable internet connectivity and difficulty managing assignment deadlines were consistently reported.

12.1.4. University Teachers' Perceptions of MOOCs' Pedagogy and Learning Design with respect to Gender, Streams of Study, and Teaching Experiences in Central Universities of North East India.

The teachers in central university of North East India exhibited generally positive perceptions of MOOCs' pedagogical value and learning design effectiveness across gender, streams of study, and teaching experience. The study revealed that female teachers, science teachers, and teachers below ten years of teaching experiences expressed stronger optimism and adaptability toward MOOCs. On the contrary, it was also found that male teachers, arts teachers, and teachers having more than ten years of teaching experiences highlighted more pragmatic challenges mainly infrastructural, institutional, and sustainability-related.

The qualitative data revealed a consistent theme across all four central universities. Teachers stressed the need for institutional support, resource access and consistent training to enhance MOOC implementation success. The overall findings of the study revealed a consistent appreciation for MOOCs as transformative tools for higher education, tempered by contextual challenges of technology integration, learner engagement, and institutional recognition.

12.2. Implication of the Study

The findings of the study have several important implications for educational policy, practice, and institutional development in higher education, particularly within the context of North East India. This includes:

1. **Strengthening Digital Infrastructure:** The moderate level of MOOC awareness and low enrolment rate among students highlights the urgent need to improve institutional infrastructure. Universities must invest in reliable internet connectivity, recording studios, and technological support systems to ensure smooth development and delivery of MOOCs.
2. **Capacity Building and Faculty Development:** Continuous professional development programs should be introduced to enhance teachers' digital literacy and pedagogical competence in using online platforms. Faculty members require ongoing training to effectively design, deliver, and assess MOOC-based learning in alignment with national and global standards.
3. **Institutional and Administrative Support:** The limited administrative ownership and dependency on third-party platforms such as SWAYAM indicate the necessity for universities to establish their own MOOC cells or dedicated e-learning centres. These bodies can coordinate local implementation, evaluation, and customization of MOOCs to meet institutional goals.
4. **Policy and Regulatory Frameworks:** Policymakers must provide clearer and more consistent guidelines for MOOC implementation, assessment, and credit transfer. Frequent changes in national regulations may discourage participation and affect the continuity of programs. A stable framework will help institutions align MOOCs with formal curricula more effectively.
5. **Inclusive and Contextualized Learning:** MOOCs should be designed to address both global standards and local educational needs. Integrating regional languages, examples, and contexts will make MOOCs more inclusive and

relatable, particularly for students in remote or underserved areas of North East India.

- 6. Motivation and Student Engagement:** Since students' perceptions of motivation and relevance do not significantly differ by gender or streams of study, universities should focus on enhancing the quality and interactivity of MOOCs to boost engagement and learning outcomes. Strategies such as peer discussion forums, mentorship, and localized content can increase participation.
- 7. Monitoring and Evaluation:** Centralized assessments may not reflect institutional realities. Therefore, universities should develop local monitoring mechanisms to track learners' progress, gather feedback, and make evidence-based improvements to MOOC delivery.
- 8. Bridging the Institutional Gap:** The example of Manipur University demonstrates how effective infrastructure and administrative commitment can lead to higher enrolment and participation. Other institutions can replicate this model by prioritizing digital transformation and collaborative partnerships.

12.3. Suggestions for Further Research

The study identifies several directions for future inquiry to enhance understanding and implementation of MOOCs in the region:

- 1. Comparative Institutional Studies:** Further research should compare MOOC adoption and effectiveness across different universities, focusing on the factors for the successful implementation and high enrollment, with particular attention to models and examples like the Educational Multimedia Research Centre at Manipur University.
- 2. Impact Assessment of MOOCs:** Further studies should rigorously examine the academic and professional impacts of MOOC participation on students and teachers, including longitudinal tracking of outcomes such as career advancement and skills acquisition.

3. **Pedagogical Innovation and Design:** Further studies could explore deeper into models of instructional design, including localized content, language diversity, and the effectiveness of the four-quadrant approach of SWAYAM-MOOCs in engaging students from different backgrounds and disciplines.
4. **Policy and Governance Evaluation:** Given the complex policy landscape and administrative structures of MOOC implementation, studies are needed on how university-level and national policies interact, and how clearer, stable guidelines might accelerate equity in access and course recognition.
5. **Teacher Professional Development:** There is a need to further explore and investigate the professional learning courses of teachers engaging with MOOCs, the barriers to digital literacy, and effective approach for ongoing training and support.
6. **Technological Barriers and Solutions:** With internet reliability and technological resource gaps being key challenges, future research should identify cost-effective infrastructure improvements and scalable digital solutions suitable for the North East Indian context.
7. **Student Engagement and Retention:** More studies should focus on understanding and mitigating factors contributing to low student enrollment and retention in MOOCs, including social, cultural, and institutional influences.
8. **Feedback and Assessment Mechanisms:** Building efficient feedback systems and decentralized evaluation frameworks can be a pathway for research to ensure student success and course quality.

Conclusion

From the major findings of both quantitative and qualitative data, the current research was limited by sample size and the reliance on self-reported data, which may restrict the relevance of findings. Institutional differences in infrastructure, support, and implementation phases warrant more granular comparative case studies.

The rapidly evolving policy framework also means that ongoing adjustment and monitoring are critical.

MOOC development and implementation in central universities of North East India are at a formative stage. Institutional support, policy clarity, infrastructural investment, and ongoing research are essential to harness MOOCs' transformative potential for higher education in the region.

13. Limitations of the study

Studying the status of MOOCs in the central universities of North East India is a challenging and crucial topic in the present-day scenario. Several limitations arose during the investigation as the study attempted to achieve its objectives.

Initial plans were made to organize focus group discussions with both teachers and students across all the central universities of North East India. However, for teachers, these discussions could not be carried out because of their busy timetables, competing academic responsibilities and difficulties in finding mutually convenient slots. As a result, the collection of qualitative data had to be restricted to interviews conducted at the time of administering the questionnaires.

During these interviews, several difficulties were encountered. Some teachers were highly cooperative, and engaged seriously with the questions, whereas others appeared rushed and were unable to spare sufficient time to discuss issues related to the planning and implementation of MOOCs in their universities. In addition, certain teachers were reluctant to reveal details of their formulated plans and programs, explaining the matters discussed in council or committee meetings were confidential and could not be shared. This lack of disclosure limited the depth and completeness of information required to fully address the study's objectives for each university. In few cases, teachers explicitly requested that the investigator refrain from asking further about their forthcoming plans for the design, delivery, and implementation of MOOCs in the institution.

Furthermore, operational challenges arose during focus group discussions such as time constraints and scheduling inconvenience resulted in unequal levels of students' participation across the selected central universities of North East India.

Due to these limitations, the researcher was unable to obtain satisfactory data during the initial investigation period extending from August 2022 to September 2023. Consequently, additional data was purposely gathered through telephone interviews using a semi-structured interview schedule with teachers from the central universities of North East India. Each telephone interview had an average duration of approximately 10 to 15 minutes.

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