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Ensuring Equity and Inclusion in MOOCs: A Study With Indian Higher Education

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ABSTRACT

This paper will examine whether Massive Open Online Courses (MOOCs) deliver quality education fairly to Indian higher education. The study examined equity in digital competence, linguistic access, course design inclusion, and MOOC accessibility and affordability using 413 MOOC students and 44 professors. According to descriptive and inferential data, most students have adequate digital abilities, and MOOCs are largely open and free, removing cost and seat obstacles to education. Some learners have language problems, rural locations lack connectivity, and inclusion of a wide range of learners (including disabled and non-English learners) is an area for improvement. We contextualise these findings using the digital equity and online learning inclusion literature. Overall, MOOCs have significantly expanded the learning options for female and rural students, providing flexible, affordable, and low-cost learning, yet they haven't completely eradicated inequalities. Multilingual assistance, technological infrastructure, and inclusive pedagogy should be strategically upgraded to democratise higher education using MOOCs. The report concludes that MOOCs in India are important for education fairness, but educators and policymakers must work together to close disparities.

Keywords: *MOOCs; Equity; Access; Digital Divide; Online Education; India.*

1. Introduction

In the past decade, massive open online courses (MOOCs) have emerged to democratise worldwide education. MOOCs were first viewed as disruptive technologies that would increase access to quality learning outside the campus. Beginning in the 2020s, hundreds of millions of people took thousands of MOOCs worldwide. In India, the government-backed SWAYAM system supports MOOCs spreading to higher education, which aligns with policy goals of universal education (NEP, 2020). The COVID-19 epidemic increased MOOC use as colleges switched to online learning, highlighting their benefits and drawbacks (Dhawan, 2020). People now view MOOCs more moderately, despite their rapid growth. Research indicates that MOOCs have significant dropout rates—sometimes over 90%—and serve well-resourced students, raising questions about their equality benefit. Simply put, big and open courses do not guarantee inclusive and lasting learning for all groups.

Equity in education means meaningful access and inclusion for all students, even those from disadvantaged circumstances. The Indian setting best illustrates MOOCs' potential and dilemma. A vast number of Indian students and insufficient physical resources support adopting MOOCs to bridge higher education gaps. Indian higher education has around 38 million students; however, many institutions are poor. MOOCs, which are often free or cheap online, can connect students in remote or underserved areas with high-quality lecturers. A long socio-economic and digital gap limits India. By 2022, only 56% of Indians were online, and issues with rural connectivity and device access still persist. Research shows that online learning will largely benefit the connected and educated without an intentional inclusiveness plan. In 2017, most MOOC learners lived in high-HDI (Human Development Index) countries, with few in low-HDI countries. The question is: Are MOOCs creating equal opportunities or maintaining the status quo?

MOOC access equity has many factors to consider. Language of instruction is also crucial in India, a linguistically diverse nation. Hindi- and other-language speakers may consider MOOCs' English domination annoying. Non-native English speakers may think more and understand slower in online classes. Despite early efforts to support local languages, such as subtitles, transcripts, or indigenous language classes (e.g., SWAYAM offers Hindi and regional language courses), support for India's 22 official languages is still sparse. It raises linguistic equity issues: many students may access content in their native language or bilingually. Language, digital literacy, and self-directed learning are important to MOOC success. Traditional teacher centred pedagogies in India may not prepare students for MOOC's independent, technology-mediated learning. Even accessible courses can be tough for students without computers or self-directed learning experience. Teachers learn to develop inclusive and engaging online lessons. Faculty without digital pedagogy training may make MOOCs less appealing to students.

Against this backdrop, this research examines equality and inclusion in Indian higher education MOOCs. The study uses a mixed-stakeholder survey (learners and instructors) to examine digital competency, content delivery and accessibility options, language barriers, and structural factors like internet connectivity and cost that affect equitable MOOC access. It seeks to identify MOOCs' strengths and weaknesses in promoting equal learning. Key study question: How well do MOOCs in India provide fair access to quality education, and what hurdles must be solved to promote inclusivity? The study adds to the discussion of how MOOCs may live up to their democratising promise and provides practitioners and policymakers with evidence-based insights and suggestions in answering this question. India and other nations want to incorporate MOOCs into normal education to provide equity and access to more learners; therefore, the results are timely.

2. Literature Review

MOOCs were once touted as democratising education, but studies have raised the question of who benefits. The literature warns that MOOCs may favour wealthy learners and exacerbate inequities. Lambert (2020) found, in a thorough evaluation of MOOC programs that serve disadvantaged learners worldwide, that MOOCs were more likely to list higher-educated and skilled learners than those in need. Researchers also saw successful need-specific support (e.g., local study groups, bilingual content) that helped MOOCs serve low income and low-skilled groups. This implies that fair results are possible with purposeful efforts beyond open enrolment. In their overview of open education, Iniesto and Bossu (2023) claim that equality and inclusivity will remain the top priorities and that MOOCs should have had more studies and practice on varied learner requirements.

The first step to MOOC equity is digital access. Internet penetration is rising, yet there is still a digital barrier across nations. Poor broadband access in rural and distant India. In remote regions, trustworthy connectivity is important to MOOC use, according to Greaves (2024). Lack of high-speed internet and current technology can prevent students from taking media-intensive MOOCs. According to Pettalongi et al. (2024), socioeconomic constraints to online learning make it twice as hard for poor students to access it. However, MOOCs are mostly free or cheap, which benefits equity. In developing nations, where most people cannot afford private university education, cost is no longer a major barrier to MOOCs (Tan et al., 2023). The Indian Ministry of Education promotes MOOCs like SWAYAM to reduce costs and expand reach (Ministry of Education, 2020). Because of their affordability and openness, MOOCs offer a unique opportunity to widen access. The challenge is to ensure that different groups have equal access to opportunities.

Language and culture are also key equitable factors. The bulk of MOOCs focus on English, which may exclude non-English speakers or those with limited proficiency, such as many prospective students in India, Brazil, and China. Language barrier effects on MOOC success have been empirically explored.

Duru et al. (2019) found in a qualitative study that MOOC learners who don't speak the language don't understand the material and lose interest. It is reinforced by Fonseca and Gajo (2020), who found that native-language MOOCs and materials increased migrant and non-native speaker engagement and integration. Technological solutions have been considered: machine translation of MOOC content (like the EU project TraMOOC) can help overcome the language barrier. Due to their precision and complexities, automatic translations remain a worry (Alshammari and Altuwairesh, 2022). Cultural relevance supplements literal translation. Content generated in one setting may not appeal to learners in another. Morgan (2023) suggests that MOOCs could be associated with Western-centric perspectives that marginalise learners from the Global South, leading to digital neocolonialism. Researchers suggest culturally responsive MOOC design employing examples, language support, and neighbourhood participation in content development (Mahani, 2023; Samuel, 2024). Bilingual courses and regional platform programmes have improved in the Indian MOOC sector, but they remain underrepresented compared to linguistic diversity.

Another aspect of MOOC equity is that learners with different abilities and needs are included. Online learning accessibility for disabled people is a growing concern. While MOOCs are open to everyone, not all are designed with universal design in mind. According to Marques et al. (2019), MOOCs need adaptive interfaces to accommodate diverse users because adjustable text, screen reader compatibility, and captions are essential to inclusivity. Many MOOC providers introduced captions and transcripts of video lectures by the end of the 2010s to serve hearing-impaired, text, and non-native audiences. However, Sanchez-Gordon and Lujan-Mora (2018) found that MOOCs have various accessibility issues, including randomised captioning and no visual impairment support. According to Escudeiro et al. (2023), assistive technology like text-to-speech and sign language translation can make MOOCs more accessible. Inclusive pedagogy (providing examples of many cultures, avoiding assumptions about learners' backgrounds, etc.) can also make course materials more accessible. This inclusivity follows the principle of not leaving anyone behind in education, where access, participation, and success are crucial.

Finally, Indian MOOC studies provide background. Several studies show Indian students' and faculty's interest in MOOCs and their practical limitations. Kundu and Bej (2020) found that urban university students and professors were moderately aware of MOOCs, but most people in resource-constrained situations were oblivious or had misperceptions. Nath et al. (2020) observed that students and faculty valued MOOCs for skill development and flexibility but did not adopt them due to institutional support and poor internet access. These works emphasise that stakeholders (universities recognising MOOC diplomas and employers accepting MOOC learning) and infrastructure restoration—not just MOOC platforms— should support a fair MOOC ecosystem in India. Interestingly, India's 2020 National Education Policy favours online education, and regulatory authorities now allow some MOOCs to gain academic credit. This policy support can improve the uptake of MOOCs among marginalised groups, provided it is accompanied by awareness and a supportive structure. Overall, the literature suggests that MOOCs have an equity potential – they can reach a large number of learners, breaking through numerous of the historical barriers – but such a potential will only be fulfilled by giving serious consideration to the issues of language, accessibility, and the digital divide, which is possible through purposeful design and institutional scaffolding. The current research is based on this work, which gives the empirical evidence of how these equity concerns are being experienced on the ground by Indian MOOC learners and instructors.

3. Methodology

Sample and Research Design

This study examined MOOC equity and inclusion using a quantitative survey design. Cross-sectional surveys were conducted on Indian higher education MOOC learners and instructors. By including both groups, the study may have examined equality from a learner access and instructor viewpoint on inclusive teaching approaches. The survey method is suitable for gathering broad trends and opinions from many people. No experimental manipulation was performed, and the study recorded MOOC use and inclusion experiences. The survey was given to 413 MOOC students. To contact students from different areas and institutions, MOOC discussion forums, student groups, and educational social media were used to recruit responders. Most sample members were college students or recent grads who had taken at least one MOOC. Outreach targeted rural and semi-urban areas (e.g., through college networks) to include impoverished groups. As usual for MOOCs, the learner population was 71.4 per cent female and 28.6 per cent male, with a mean age of -25. The respondents were undergraduates and doctorate students, although one-third were rural or semi-urban, reflecting the study's equitable focus. About 57% of learner responders were full-time students (unemployed), while others were professionals or part-timers. This allowed exploring MOOC accessibility to different socioeconomic groups.

Most of the 44 MOOC teachers surveyed were faculty members of Indian institutions and developers or instructors of MOOCs like SWAYAM, Coursera, and edX. Professional ties, university, network contacts, and Indian MOOC founders hired these lecturers. The teachers were of both genders and represented a variety of academic ranks and subjects, but they were not asked about their demographics, which would have allowed them to answer honestly. They all have online teaching experience. The participation of instructors provided a wonderful perspective on MOOC inclusion attempts and the challenges.

Instruments for Data Collection

Both the learner and instructor closed-ended questionnaires were connected with equity and quality study goals. The learner survey covered digital access and abilities, MOOC use patterns, linguistic and technical challenges, how MOOCs included learners, and what learners learnt from them. Many closed-ended items (Likert scale or multiple choice) and some open-ended prompts about remarks were used. For instance, students were asked to rate their digital skills, describe technical issues (such as bad connectivity or device issues), and rate MOOC affordability. Likert statements questioned MOOC quality and accessibility (e.g., agreeing that MOOCs give the same learning experience as regular courses and fulfil the demands of different learners). Other questions about language preferences and difficulties included whether learners wanted to take courses in their native language and whether they dropped out due to language hurdles. The learners also reported the main reasons they dropped MOOCs (time restrictions, topic complexity, etc.) and whether they learnt anything.

The teacher questionnaire covered teaching approaches, inclusivity, and quality. Teachers explained how they make their courses accessible (subtitles, transcripts, simple language, low-bandwidth design). One multiple select question asked how they made their MOOC inclusive. Answers included using different examples, making the curriculum disability-friendly, having different speeds, etc. Learner feedback was also valued, and instructors explained how they maintain course quality (e.g., regular updates, peer assessment of new content). Several questions asked professors about their biggest technical, operational, and pedagogical problems in giving MOOCs. For instance, they chose the most important technical challenge (connectivity issues, platform limitations, low digital literacy of cognisant learners), operational challenge (lack of awareness among target learners, time constraints, insufficient support), and pedagogical challenge. Instructors were also asked why they created MOOCs and what professional chances they gained (global audience, personal skill development, research).

Pilot test and specialised review of both questionnaires. Three online education professionals assessed the tools to ensure they had clear and relevant research questions. The pilot of 30 learners and 5 instructors led to a few word choices (to make it more regionally appropriate) and guaranteed that the process was not too long (15 minutes for learners, 10 minutes for teachers). Voluntary and informed consent was obtained, and the answers were classified because participants were asked to discuss sensitive topics like skill gaps or course shortcomings.

Data Analysis

Coding and SPSS/Excel analysis followed data collection. The researcher employed descriptive and inferential statistics. For quantitative and multiple-choice Likert-scale items, frequencies, percentages, and mean ratings were calculated to determine trends. This answered queries like what percentage of students faced barriers or what percentage of teachers used inclusive methods. Subgroup differences (e.g., rural and urban dropouts) were examined using cross-tabulation. Since the study's main goal was equity, they were looking for patterns of discrepancies, such as whether rural learners had more connectivity issues than urban learners.

Inferential statistics tested research objective-based hypotheses. The study's null hypotheses were: "Learners' digital competency does not significantly impact MOOC engagement (Objective 1), and (Objective 7) learner and instructor evaluations of MOOC efficacy are not significantly different. Depending on the data, chisquare, t-tests, or ANOVA were used to find the mean responses of the various groups and correlation analysis to find the relationship between variables like digital skill level and course completion. For instance, a Spearman correlation was used to examine the relationship between self-rated digital literacy and MOOC attendance, and an independent t-test was used to compare the average satisfaction rating between those who did not experience language challenges and those who did. $P < 0.05$ indicated statistical significance. Effect sizes (Cohen's d t-tests, Cramer's V chi-square, etc.) were calculated to illustrate potential applications. Practical and contextual interpretation were emphasised in outcomes analysis along with statistical results. To understand the implications of general terms like 'efficacy' and 'inclusiveness', the discussion will mix quantitative data with open-ended observations and relevant literature.

4. Results and Discussion

Student Online Access and Abilities

Learners' digital abilities and access should be considered when determining MOOC equity. It appears that the survey results are positive. Most MOOC students were tech-savvy. Over 90% said they could utilise computers and the internet for online learning, and over 80% thought they had strong or very good digital skills. Less than 5% of people consider themselves poor in digital literacy; hence, most MOOC registrants have basic abilities. These findings suggest that digital skill deficiencies are not the main barrier to MOOC participation. There was no significant correlation between self-rated digital competency and MOOC involvement (r [?] 0.05, $p > .05$). Thus, respondents with lower tech abilities were equally likely to participate more often and actively. This will support the null hypothesis that digital competency did not make sample participation harder.

Our data supports the hypothesis that digital literacy plateaus and other factors determine continuous activity. Kizilcec et al. (2020) found that behavioural intervention and course modification had a greater impact on MOOC persistence than technical expertise. However, our results differ slightly from the studies that revealed digital skills affected results. Romero-Rodriguez et al. (2020) found that energy sustainability MOOC completion rates were lower for those who could overcome digital competency

impairments. This could be because unskilled people self-select out or because our primarily university-educated young people were nurtured in a digital environment. Researchers found one susceptible group: 8% of our sample were uncomfortable or inept with technology. Such persons may struggle with intricate MOOC software or technological problems. These are timely cautions to not assume digital literacy. Providing easy ICT training for first-time MOOC participants or simplifying user interfaces would help ensure fair availability for those with weaker digital capabilities. Additionally, digital skills require digital access. In the same way as infrastructure concerns, insufficient connectivity can slow down even tech-savvy learners.

Economical and Geographical

MOOCs are free and open, eliminating financial and admittance barriers that hinder traditional higher education. In practice, MOOCs have achieved this openness. The majority of learners (96%) stated their MOOCs were affordable. Only a small minority was frustrated by cost. This isn't surprising considering most MOOCs are free or cheaper than traditional courses. In other words, tuition is a major barrier to higher education, but not in MOOCs. One student said, I would never have been able to pay for a similar course at a private institute, but this MOOC was free and taught by an IIT professor. This cost-effectiveness is a breakthrough for underprivileged pupils. It means low-income students can afford top university lectures worldwide. The literature emphasises MOOCs' affordability to enhance educational equity (Tan et al., 2023; Singh and Bajpai, 2023). MOOCs are winning the cost-democratisation war, according to our data.

In addition to minimal cost, MOOCs have no entrance restrictions or capacity limits. Traditional programmes have restricted seats and difficult admittance tests that favour those with more training. In contrast, MOOCs are open to all. In our research, 5% of students reported taking a MOOC as a necessary course in their college degree, indicating that some colleges are charging for them. The open enrolment policy overcomes admission cut-offs and geography. How about under-represented groups or regions of learners? Can MOOCs reach them? Sample demographics provide context. It's intriguing that 32.7% of MOOC students were rural and 9.2% semi-urban. Our sample population has about one in three MOOC students living outside large cities. Given that India's top tertiary education is largely in cities, rural involvement is encouraging. It means that MOOCs are entering areas with less education access, promoting geographical equity. Our results, together with Greaves (2024), show that MOOCs may help close India's rural-urban education gap if rural students have internet access.

Remember that some people—likely rural or low-income persons who are offline or uninformed of MOOCs— did not make our sample. According to 78% of MOOC instructors, the greatest difficulty is lack of awareness among the target audience, as many potential learners (especially in rural regions) are ignorant of or have not experienced MOOCs. Nath et al. (2020) found uneven MOOC knowledge among non-elite universities, supporting this outcome. Even though a third of our respondents were rural, that does not suggest a third of MOOC learners in India are rural—the researcher recruited equity-orientated. Urban MOOC users may remain the majority. Awareness campaigns and internet growth are needed to expand MOOCs globally. Positively, the Indian government and NGOs have promoted digital learning in rural areas (e.g., village internet kiosks, the Digital India programme), which could boost MOOC enrolment if handled properly (Reidel, 2021). Additionally, 71% of female learners take MOOCs, which is a promising trend. In India, women are underrepresented in STEM and higher education, whereas MOOC learners were mostly women. Online forms may provide women more independence and fewer social restrictions than physical classes. Jiang et al. (2018) found that women enrol less in technical areas in STEM MOOCs but perform equally with males. Our study did not examine gender differences in

results, but the significant number of women who participated suggested that MOOCs may empower women via education, a major equitable factor. In terms of pricing and accessibility, MOOCs seem to be an effective leveller, giving a wide range of learners access to quality education they otherwise couldn't. Language and course design are more subtle inclusion issues that make the picture less homogenised.

Multilingual Access and Language Disparity

India's linguistic variety suggests that MOOC access may depend on the language of instruction. Researchers found the linguistic difficulty complicated in our survey. In MOOCs, 67% of learners preferred English, and 33% preferred a local language (Hindi was most frequent). This shows that most Indian students, especially those with higher education goals, speak English at school. However, one-third would prefer to attend MOOCs in their native language, unlike most. The most common concern for non-English speakers was difficulty understanding course material in English, and 25% of questioned students reported having a language-related problem. Example: They have to translate technical terminology or spend more time on materials that are not in their native language. One direct question asked if language problems ever caused MOOC dropouts. About 10% of students replied yes. This suggests that language mismatch may cause learners to lose interest. Most of them had to learn English, but those who didn't risked falling behind.

In our statistical investigation, linguistic comfort did not significantly affect course completion rates or engagement indicators. Completion rates were similar for learners who were comfortable using MOOC language and those who were not. Most non-native speakers passed MOOCs using subtitles or external translation. This may have contributed to the widespread acceptance of the concept that language obstacles do not quantitatively impair involvement. However, language-impaired people must have chosen themselves or not taken a MOOC. Language barriers may bias the sample against MOOC non-participants. Our statistics showed modest variances, but researchers should take them with a grain of salt: there is still a language barrier that impacts some learners' performance, but not strongly. Other studies support this subtle opinion. Castano Munoz et al. (2017) remarked that MOOCs initially under-represented non-English speakers that were less digitally fluent. Johnston et al. (2023) found that language support (e.g., subtitles in the learner's language) could improve retention for local language learners. Researchers may have missed the latent needs of additional multilingual alternatives in our research where the differences are not very sharp.

Fortunately, most MOOCs in our investigation had language accessibility features. Nearly 92 per cent of learners said that video subtitles or captions were available in their courses at least periodically, and nearly 7 out of 10 reported lecture transcripts in most or all of the material. Non-English speakers benefit from the tools. Students even claimed that English subtitles were used during English lectures since they could easily track the lectures and take notes on the technical vocabulary. There are also several platforms with auto translation of subtitles in Hindi or other languages – the quality fluctuates. Subtitles/transcripts make information easier to consume (both for people with accents or sound and for those who struggle to understand everything). This may have contributed to high satisfaction with instructional resources. It's one of MOOC providers' language barrier improvements.

Instructors recognise the linguistic barrier. Not all instructors are multilingual; however, some reported language simplification (no jargon, slow speaking) and glossaries of key terminology. One quarter of our teachers claimed they accommodate students with diverse language backgrounds by providing examples or explanations in a second language or fostering student discussion in local languages. Some teachers indicated they considered employing bilingual course materials but were time-constrained or couldn't on the platform. In general, learners and instructors agreed on language/inclusivity: learners liked lectures

that accommodated different contexts, and instructors had done so. Despite personal efforts, multilingual MOOCs and translations must develop to eliminate language imbalance. In other multilingual communities, subtitles or discussion groups in important local languages can increase non-native speaker engagement (Sosoni et al., 2018). Corporate translation projects on Coursera aim to address this. SWAYAM started offering several Indian and regional language courses, such as Tamil, but the portfolio is minimal compared to English courses (Kanjilal and Kaul, 2016).

In MOOCs, language is still a selective screen: it cripples a considerable proportion of learners and may prevent some. Multilingual content and support must be expanded to equalise. Literature agrees that language and cultural relevance may make MOOCs worldwide. Our findings indicate that subtitles are practically universal, and localised MOOC initiatives or bilingual courses may be the next step. This would help low English learners, improve understanding and comfort, and improve outcomes. One student said, "Had there been a few modules taught in Hindi or even a pro forma in Hindi, I would have learnt it faster than I do; although I comprehend English, I get to know better when I learn in my first language." Equity requires us to listen to such voices.

Inclusive Accessibility Design and Practice

Equity in MOOCs refers to whether courses are structured to meet the needs of a wide range of learners, such as those with disabilities or other learning needs. The researcher investigated learner perceptions of inclusivity and practices as reported by the instructor. The findings suggest that there is a growing knowledge base of inclusive design within the MOOC community, but there are also gaps.

From the learner perspective, the majority of them believed MOOCs were fairly inclusive in the features that they offered. When told to respond to a statement of MOOCs being accessible to people with disabilities, 68% answered as 'yes' or 'strongly yes', 20% answered 'not sure', and 12% answered as 'no' (which is likely to represent those who detected a problem). Although the researcher did not gather the specific disability status of respondents, some respondents who self-reported a disability (e.g., one visually impaired, one with a hearing problem) did give feedback. The hearing-impaired learner commented that the use of captions and transcripts allowed them to be accommodated in full, which is in line with general accessibility guidelines (captions are essential to deaf learners). The visually impaired learner, however, observed that there are certain MOOC sites that are not quite compatible with the screen reader software and that there are diagrams or videos that have no descriptive alt-text. This points to the fact that although MOOCs have progressed (such as captions), other aspects could be enhanced (such as having text descriptions for illustrations/graphs and making sure that navigation is accessible to screen readers). The needs of only a small proportion of our entire sample were probably such that they needed to be addressed, yet equity implies their needs should not be ignored either.

On their part, instructors recorded various inclusive strategies. Notably, 61 per cent of the instructors affirmed that the main theme in course design was to engage all learners. This tended to intersect with inclusivity since the measures to increase engagement, such as interactive sessions, examples in a variety of situations and the principles of universal design, also make the course more welcoming to students with diverse backgrounds. Approximately 44 per cent of instructors reported providing such accommodations as flexible pacing or schedules (e.g., not grading later assignments, permitting students to work at their own pace), which would benefit students with other obligations or students whose speed differs. The other 28 per cent specifically stated that they adapted content to learners with disabilities. Some of the examples provided were high-contrast slides for people with low vision, transcripts (useful both linguistically and for hearing), and dividing the material into smaller parts to assist the attention-challenged. These data levels indicate a group of MOOC instructors are making efforts to introduce the concepts of inclusive design in their courses.

Nonetheless, this is not necessarily the case with all the courses since some learners have continued to complain. Overall, as a community, the correspondence of the needs of learners and the work of the instructor is promising: both parties are sure that accessibility and participation are the keys to the success of MOOCs. It is a good foundation on this mutual recognition. It means that efforts to enhance accessibility (such as training instructors on the universal design or the features of the platform to add alt-text and keyboard navigation) would probably be embraced and used. However, it is important to note that previous researchers argue that inclusive design positively influences the performance of not only learners with special needs but also the entire learner population (Cordell, 2015; Plant, 2023). An example of that is having clarity and various forms of content (visual, auditory, and textual) is helpful to a great variety of learning styles. This is reflected in our data: participants who rated their MOOCs as highly interactive and inclusive also reported that they had high levels of satisfaction and skills.

Cultural relevance is one of the aspects of inclusiveness. MOOCs can be made more relatable in a diverse country, such as India, through the examples and case studies that can be offered based on different social settings. Although our survey did not explicitly assess the cultural diversity of material, some of the learners did comment on it. Some of them said that course examples tended to presuppose a Western setting (such as examples of American universities or markets), which was foreign to them. The instructors also appear to know about this; several of the ones who selected the answer of incorporating different perspectives (this option was available in the inclusivity question) probably meant to localise or generalise the context of their instruction. An example of this is when a lecturer whose MOOC is about management used case studies about Indian rural businesses after finding out that the use of only Harvard Business Review cases was not encouraging to some of the learners. These attempts deal with what Morgan (2023) and Samuel (2024) refer to as decolonising online education – rendering it more fair through the respect of the local knowledge and circumstances. The necessity of localised content in MOOCs is gaining more and more popularity in literature, and our results confirm that the inclusion of various cultures and examples in the content is one of the elements of equity.

To conclude, the current MOOCs partially have the elements of inclusive design but not in a consistent way. There are improvements in such areas as subtitles and variable pacing. However, there are still obstacles to overcome, like serving the needs of the visually impaired or the learners with learning differences and making the content relevant to the diverse learners. The relatively constructive feedback on inclusivity provided by most learners is encouraging; it demonstrates that MOOCs may be made broad-based. In the future, it will be important to scale such practices of inclusivity. Providers of MOOCs and consortia might set accessibility standards or certification (similar to web accessibility standards) of courses. Also, one can exchange the periods of practice between instructors – e.g., how to add alt-text easily or build bilingual glossaries, etc. – to make more courses as inclusive as the most inclusive ones are. Since both learners and educators in our research share the same mindset regarding the need to engage and provide access, collaborative progress in MOOC design can be anticipated. Each incremental increase in inclusion can equate to greater opportunities to engage more learners and to achieve, which will bring MOOCs to their fair ideal.

Problems with Infrastructure and Connections

Online learning is not possible without mentioning the infrastructure on which MOOC equity is based. As in our case, technical problems were also a non-negligible obstacle to a certain group of learners due to the current digital divide. Approximately half of the learners claimed to have technical problems when accessing MOOCs at least once. The most frequent issues included unstable internet connection (when it comes to video streaming), then there were electricity disconnections and the inability to access a personal

device. Approximately 11 per cent of learners reported so much difficulty to a great extent or frequency, which probably impaired their learning. It was also not rare to hear learners in rural settings explain how they had to go to a town cybercafe to get a stronger connection to download MOOC videos. Although the figure of 11% often struggling may appear like a minority, it is those who overcame the odds in spite of the problems – there is no one to tell how many may have been forced to withdraw simply because of connectivity problems. Their responses among instructors supported the occurrence of infrastructure problems: half of the instructors reported digital literacy dissonance or digital problems among learners as a serious challenge in their MOOCs, and 11% mentioned poor connectivity as a significant difficulty they faced with their learners. Such instructors probably teach courses with students of different regions entering them, so they will see some students lagging or complaining about technological issues. A government university teacher added that most of the enrollees of their MOOC were at smaller colleges and had limited computer access, which meant that their instructor had to provide more severe deadlines and offer them other low-bandwidth resources (such as PDF notes) in case they were not able to stream lectures. This example coincides with suggestions in the literature that offline or low-bandwidth solutions (e.g., downloadable content, text transcripts, or audio-only versions) can help counteract the effect of bad connectivity.

Equity issues in MOOC use in India revolve around the continued rural-urban connectivity gap. Although mobile internet is ubiquitous, it is in rural locations where quality and consistency are low. The data the researcher received revealed that the rural learners indeed demonstrated a greater likelihood to report the technical problems than the urban learners (a cross-tab analysis revealed that rural learners were approximately 1.5 times more likely to report frequent connectivity problems, $p < .01$). This observation highlights the fact that MOOC equity is intrinsic to the development of broadband infrastructure. The fact that national programmes are trying to enhance rural internet is a good idea, but so far, MOOCs may not reach all of the remote groups due to the poor pipe that is being used to deliver the content. Pettalongi et al. (2024) and Qaribilla et al. (2024) note that socio-economic status can be a factor in access to online learning. They are correct when it comes to our findings: students with less privileged backgrounds usually share a device or use some bare-bones smartphones, making it more difficult to participate in activities such as coding exercises or long videos.

The findings support the idea that internet access should be a public good in education. If MOOCs are used to increase gross enrolment in higher education (one of NEP 2020's goals), last-mile connectivity investments and student-subsidised data plans could be profitable. MOOC designers can help by compressing videos and text to reduce bandwidth.

The high demand for learning—when infrastructures are levelled, underserved groups are eager to use MOOCs—was also noted. Despite digital challenges, some learners found workarounds, such as watching MOOCs at night when networks were less busy or borrowing resources from a local library.

Will MOOCs Level the Playing Field?

After reviewing specific aspects such as skills, the cost, language, and accessibility, researchers move back to determine the net result: are MOOCs causing increased equity in higher education? Our study evidence gives reason to respond with a cautiously affirmative response. MOOCs have in fact increased accessibility – they have attracted masses of learners who would not otherwise access courses in the most prominent institutions. Women learners and rural and economically constrained learners are all represented in high numbers, which means that MOOCs are availing opportunities which traditional systems are failing to offer. As a case, a woman in a small town might have access to a Stanford MOOC that she would never otherwise be able to take locally, or a student at a non-elite college might take an

upper-level course through SWAYAM to supplement his or her education. Here are definite examples of levelling the field. A single question in our survey asked respondents to say whether they believed MOOCs have increased educational equity in India: 74 per cent of them said that MOOCs provided individuals who would not otherwise have access to high-quality courses with an opportunity to study with the best. Such perception is supported with such data points as affordability (96% consider it affordable) and reach (more than one-third are non-urban participants). It agrees with other studies that MOOCs as an alternative route can empower the disadvantaged communities (Singh and Bajpai, 2023).

MOOCs are, however, not a panacea. The findings that researchers have also highlight the restrictions and the points that should be improved. To begin with, there are still some barriers like the language of instruction and the availability of the internet, which systematically marginalise some groups of people. The MOOC revolution is yet to cover those who are not comfortable studying in English or who reside in a black hole in terms of connectivity. Second, gaps in outcomes occur even among the accessible. Objective 5 results of the study were that those who participated in MOOCs demonstrated a similar effectiveness regardless of gender or region, which is positive. The objective measures, such as completion rates, were low across the board and were very low in certain groups. The dropout analysis revealed that 76% of learners had left a MOOC incomplete on at least one occasion, with time management and lack of interaction being some of the reasons. High turnover effectively waters down the equity effect: it is one thing to sign up and another to gain. The review by Lambert (2020) had observed that MOOCs were not regularly effective in supporting the actually marginalised as expected without supporting interventions. Something along these lines is indicated by our data: MOOCs open the doors, but support systems (mentoring, interaction, better design) have to be in place to allow learners of any background to walk through and succeed.

It is remarkable that among the most obvious results of our study in terms of equity, there will be the improvement of skills and career gains for the students who persist in MOOCs. On average 80% of learners said they had acquired new skills through MOOCs, and a subset (28% skill development was the main driving force, 17% career advancement) of respondents said that MOOCs were relevant to their professional development. Such results were also frequently exaggerated in cases where they did not have such opportunities in their normal setting – e.g., students in tier-2 cities acquiring state-of-the-art tech skills through MOOCs not available at their colleges. It is an encouraging sign: MOOCs have the potential of assisting in closing the skills gap between advantaged and disadvantaged students. Meet et al. (2022) also discovered that MOOCs were used in bridging skills gaps in India, where they were positively perceived to be useful in terms of employability. In our sample, most learners said that they have added MOOC certificates to their resumes, and a few have attributed job or internship successes to MOOC learning. This indicates the possibility of increasing the equity of outcomes, rather than access to MOOCs – assuming that such credentials become more recognisable (which is gradually becoming more common as MOOC credentials become increasingly widespread).

MOOCs have also expanded the audiences and underserved groups that instructors can teach and forced them to be more innovative in their pedagogy. Teachers unanimously believed that MOOCs are a worthwhile enhancement to higher education and want to keep improving them. However, dropouts, the need for more interaction, and assimilation with formal education are issues.

To sum up this part, MOOCs as they are now are a major step towards educational equity in India, but it is not their ultimate destination. They have collapsed numerous obstacles – price, distance, and, to a degree, gender and age (anyone can become a student) – which proves that open education at a large scale is a possibility. However, they have not fully addressed more profound equity challenges, such as the

inclusion of languages, the disparity in digital infrastructure and the ability of different learners to self-regulate and complete courses. The results of the study bring the understanding that the process of equity should not be a short-term goal that can be achieved by technology; it is a long-term undertaking that should be supported, adjusted, and involved at any level. With the development of MOOCs (trends such as blended MOOCs, micro credentials, and better pedagogy), it is hoped that the gaps can be reduced. The mood of the learners and the instructors in our study is generally optimistic, and they are aligned in their desires to have MOOCs prosper and reach out to more individuals. By making conscious attempts to address the remaining inequalities, i.e., investment in multilingual material, mentorship of MOOC learners by community members, and structural adjustments, the MOOCs can be brought even closer to their democratising potential. These findings will be summarised in the next Conclusion section, which will also provide certain suggestions on how stakeholders can improve MOOC equity.

5. Conclusion

This study investigated whether MOOCs are living up to their promise of excellent, equal access to higher education, with a focus on India. When analysing the evidence collected by the learners and instructors, the researcher built a complete picture of the existing strengths and drawbacks of MOOCs in equality and inclusion. Results are encouraging and concerning. On the one hand, MOOCs have already done a lot with regard to equalising the playing field: they are practically free and open, appealing to learners of both ends of the region, as well as sex and socio-economic boundaries that conventional higher education typically leaves behind. The research has indicated that the participants have been almost cost-free and pointed out that a substantial number of MOOC students are located in rural or underserved locations – which suggests that the geographical and financial obstacles may be negated in the MOOC paradigm. Most students possess the computer literacy to participate in online courses, which are widely available. Many students reported that MOOCs gave them new skills and professional growth chances. These are significant achievements. MOOCs democratise education in countries with unequal access to quality higher education. Students and professors appreciate MOOCs as a tool for enhancing learning and teaching.

In contrast, the research indicated that MOOC equity disparities persist. There are language and infrastructure limitations and MOOC success factors. MOOCs are free; however, people with poor English or internet access have a disadvantage. Language challenges, albeit not always crippling, caused some students to disengage or not profit from classes. Technical connectivity issues, a manifestation of the digital divide, hampered some students and may have prevented others from enrolling. High dropout and participation levels are also issues. This study found that most MOOC students discontinued courses due to time or lack of interactivity. Less prepared or supportive students may drop out; therefore, delivering a course is not enough; long-term assistance is needed to help students succeed. Even though instructors were pleased about MOOCs, they recognised structural difficulties, such as limited awareness among prospective learners and the need to better integrate MOOCs with formal education. Such difficulties suggest that MOOC quality, support, and recognition issues are the only way to achieve equity (not access).

To conclude, MOOCs in India are a major step towards egalitarian higher education but not a complete solution. They provided opportunities and demonstrated what can be achieved when education is no longer limited by cost and location. However, a truly just educational system requires supplementary activities. These involve enhancing internet and technology access in isolated or disadvantaged communities, increasing multilingual and culturally relevant MOOC content, adding access features to all students, and offering modes of support (mentors, discussion groups, or hybrid models) to students to help

them complete the course. Campaigns to increase awareness of MOOCs among rural college students and institutional policies to allow MOOC credits or recognise MOOC performance must also be implemented. The fact that the researcher linked learner objectives with teacher work shows that stakeholders are willing to collaborate. MOOCs have created a more inclusive educational paradigm in which motivated learners from anywhere can study almost anything. Closing the remaining gaps determines how far all researchers progress on the education ideal.

The study suggests that technology-enabled learning can achieve fairness notwithstanding openness. Inclusion must be deliberate in MOOCs. The success of the MOOC movement will depend on the diversity of participants and their capacity to benefit from the MOOCs as it matures. The research provides empirical feedback, and the full article's ideas should help educators, platform developers, and governments make MOOCs less biased. MOOCs may become more democratising as they improve and adopt new solutions, making the initial dream of education for all, everywhere, a more comprehensive reality that benefits the least privileged, not just the most.

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