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University Students' and Teachers' Perceptions on the Effectiveness of MOOCs in the Teaching-Learning Process

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Abstract
Massive Open Online Courses (MOOCs) have become one of the highly accepted sources of online teaching and learning these days. Even though MOOCs have gotten wider popularity, its efficacy in teaching and learning is an ongoing topic of discussion. The narrative review in this paper provided the detailed insights of the effectiveness and the limitations of the MOOCs in the academic literature. The present research performs qualitative data analysis using Grounded Theory method (interpretative approach) to find out the effectiveness of MOOCs in teaching and learning involving university teachers handling MOOCs modules and students learning them in a longitudinal study of two successive academic years. The research identifies the benefits, drawbacks, and ideas and recommendations for enhancing MOOC-based teaching and learning.

Keywords: Effectiveness of MOOCs, Teaching, Learning, Grounded theory, Advantages, Limitations, Suggestions, Recommendations

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Introduction

MOOCs aim to improve access to higher education, provide an affordable alternative to formal education, facilitate the achievement of Sustainable Development Goals, offer a flexible learning schedule and create online collaborations. There is a coalescence of interest from the educational institutions in offering individualized and personalized instructions to its stakeholders. Individualized instruction gained momentum owing to its pedagogical benefits like the use of learner-specific or inclusive teaching and assessment methods. Furthermore, integrating ICT allows the students to continue their learning ensuring that they get proper guidance, flexibility, and learning support to expand opportunities for academic growth. MOOCs are one such innovation that integrates social networking and online resources. Most significantly, MOOCs allow learners to self-organize their learning based on their knowledge, skills, and interests. It is considered an innovation in open online courses with several options e.g., accessible open resources, open-ended outcomes, and free-open registration. Similar opinions were documented by Hollands and Tirthali (2014) who reported that 38 % of the institutions they studied offer MOOCs as a new model in higher education and innovation in pedagogy. Students choose to enroll in MOOCs for a variety of reasons. The university students' main drive to enroll in MOOCs is to gain knowledge and acquire degrees; whereas, it is research and professional development for the general public (Mohan et al., 2020). Students choose MOOCs primarily to understand subject matter without any demand to achieve anything or complete, for gaining social experience, to overcome barriers posed by traditional education systems and, to be involved in online education (Sonwalkar & Maheshkar, 2015). Siemens (2013) observed MOOC as a platform that offers balanced teaching-learning to its stakeholders who are tangled between standardized educational backgrounds and colossal perplexed open web data. Vázquez-Cano et al. (2021) concede MOOCs as accessible, practical, and encouraging methods to learn online. Sonwalkar and Maheshkar (2015) clarify that the registered students who do not complete the course do not curtail the other students' chance of enrolling in the course. Thus, MOOCs foster a culture of continuous learning in an increasingly digital and interconnected world. *The following narrative review provides insight into the advantages and limitations of MOOCs as discussed in the academic literature.*

Advantages of MOOCS in Teaching-Learning Process

Kesim and Altınpulluk (2015) documented the transparent nature of the MOOCs program, where it spells out the fee charged for receiving the certification, fundamentals to be known to take the course, and learning outcomes in the course description. Chew (2015) highlighted that students registering for MOOCs courses do not need to take any test or possess any prerequisite knowledge or qualifications. Further, Kesim and Altınpulluk (2015) perceived that MOOCs had assisted teachers in cognizing their teaching and its consequences on students' cognitive development through quantitative data gathered from a good number of enrolled students' behavior (Kesim & Altınpulluk, 2015). Teachers perceived that MOOCs delivered premier learning opportunities to a large group of students with openness and provided access to quality resources (Cabrera & Fernández-Ferrer, 2017). Further, MOOCs allow students to revisit the learning materials as and when required to understand the concepts (Chew, 2015). The participants reported MOOCs' role in alleviating infrastructure constraints, providing flexibility in time and place of study, continuing education, providing a no-risk and low-cost option in completing the course on time and, covering the global audience. The strategies adopted by MOOCs in enhancing the educational outcomes include course re-designing, immediate feedback, short videos, gamification, and adaptive learning. Institutions offering MOOCs use web-based tools to support the educational outcomes of their learners (Hollands & Tirthali, 2014). Further, Azevedo et al., (2024) in their analysis observed that the MOOCs with multimodal resources, such as videos and subtitles, were particularly valued, contributing to a better understanding of the course content in learners.

Vázquez-Cano et al. (2021) highlighted the following significant points of MOOCs that use web-based tools: Attain an optimal level of learning, attend to individual characteristics, accountable for obtaining process efficiency, active participation of students and act as a valuable teaching resource that aid knowledge construction. These web-based tools allow MOOCs to slot lectures for participants beyond geographical boundaries having different time zones. It allows the students to recoup the missed lectures at a suitable time of their choice (Chew, 2015). Also, by integrating these web-based tools, MOOCs support the students in solving real-life problems. It facilitates the students to understand the theories and concepts, thereby sharing ideas during discussions for review and assessment of the peer groups (Faizuddin & Azeeza, 2015). In addition to the traditional resources e.g., readings, videos, and assessment questionnaires, web-based tools in MOOCs promote learners to interact and collaborate with a community including students, teachers, and teaching assistants (Vázquez-Cano et al., 2021).

MOOCs are said to be trending as a techno-social innovation in higher education that promotes a novel interactive environment to a considerable number of learners (Vázquez-Cano et al., 2021). Yuan et al. (2014) documented the contribution of MOOCs in providing opportunities for learners to team up with individuals interested in similar topics and make significant collaborations with a massive community beyond the courses. The students gain a broader perception prevailing among different groups of people from different countries on a particular topic as MOOCs pave the way for interaction as put forth by Sonwalkar and Maheshkar (2015).

Vázquez-Cano et al. (2021) perceived that the significance of MOOCs like flexibility, accessibility to resources, and collaboration in social networks could be considered in transforming and improving formal higher education in the following ways: Relating and improving the formal processes with the activity of students in social networks, endorsing the universal teaching methods that support all students to learn at flexible timings and interact with other students and promoting access to quality education which supports in attaining the objectives of sustainable development.

The revolution initiated by MOOCs in the curriculum and teaching resulted in enhancing teaching and research in educational institutions. MOOCs ensued a paradigm shift in teaching from traditional, teacher-centered classes to innovative, learner-centered ones. MOOCs help students become active participants in knowledge construction rather than remaining passive receivers (Li, 2019). Similarly, Abhishek et al. (2025) documented that MOOCs have a more positive influence on students learning efficiency as perceived by both students and teachers in Indian context.

MOOCS as a simulated learning platform connects individuals in their interested field of study and provides flexible teaching. MOOCs magnify students' training opportunities without their affiliation to a particular institution and act as a breaking point and a revolution in higher education (Vázquez-Cano et al., 2021). Another notable revolution is that the students can get the certification in the aspired field with the help of a credit-transferring system that converts their MOOCs' scores into credits (Li, 2019).

Further, Vázquez-Cano et al. (2021) characterize MOOCs as a significant factor in promoting universalization of education and continuous training. MOOCs promote the learning of individuals who require it at any place. It guarantees education to the displaced population of society e.g., refugees from fragile socio-cultural contexts, thus promoting the globalization of knowledge. Faizuddin and Azeeza (2015) also express similar views as MOOCs offer equal rights to the participants in accessing quality education. Similarly, MOOCs promote digital inclusion in students who are excluded and offer divergent contents that are interesting and of high standards (Vázquez-Cano et al., 2021).

In addition to facilitating learning of a specific subject, MOOCs provide free quality training to any individual with an internet connection, irrespective of their previous training experiences (Vázquez-Cano et al., 2021). Also, students can make choices from a wide variety of courses and provide opportunities to enroll in those that suit best to one's individual needs (Sonwalkar & Maheshkar, 2015).

Likewise, Walker and Loch (2014) acknowledge MOOCs as an efficient system in providing a user-friendly platform with flexible rules and regulations to the large group of students in terms of economy and providing quality resources. Chew (2015) observes that certain MOOCs permit their students to access expensive resources such as images taken with the help of fully automated robotic telescopes for their research investigations.

In addition, it provides opportunities to learn a wide range of trending and updated topics (Cabrera & Fernández-Ferrer, 2017). Similar merits of MOOCs are reported by Li (2019), who acknowledge the diversity of courses, autonomy, openness, and accessibility with a choice of varied languages. Apart from the theoretical courses, one can find practical and other skill-oriented ones (Li, 2019). The platform allows individuals to choose a particular course from a distinguished university and by a renowned educator having known expertise in it (Sonwalkar & Maheshkar, 2015).

Specific courses offered in MOOCs are closely associated with industries that allow students to access the industrial resources and play a pivotal role in their progress (Li, 2019). In another case reported by Hoy (2014), MOOCs fulfill the physicians' requirements in providing courses related to continuing medical education and patient education with a modest fee.

In the case of teachers, MOOCs provide opportunities to professionally develop their skills related to content, design, evaluation, and integration of web-based tools in their teaching (Li, 2019) further amplifying the reputation of teachers or universities offering quality MOOCs. It is believed that re-using MOOCs materials, sharing course

materials, replacing on-campus courses with MOOCs, reducing the need for institutional facilities, and developing quality courses to offer across institutions are possible cost-saving mechanisms for the higher educational institutions (Hollands & Tirthali, 2014). An effective MOOCs course that attracts huge participants brings laurels to the teacher and can be equated to any research. MOOCs provide academic growth to young teachers interested in teaching amidst competition in research activities (Li, 2019).

Research in these fields results in ideal forms of perennial learning environments that support the disadvantaged individuals by digital inclusion on one hand and groups the communities virtually with mutual intelligence and knowledge on the other (Vázquez-Cano et al., 2021).

Limitations of MOOCS in Teaching-Learning Process

On the one hand, Hollands and Tirthali (2014) presume it difficult to measure the values gained by MOOCs unless they can be tied to further, more tangible objectives. On the other hand, Sonwalkar and Maheshkar (2015) assert that the benefits of MOOCs are said to be already realized with Open and Distance Learning (ODL) innovations. MOOCs are merely a package with over content in the name of innovations.

Hollands and Tirthali (2014) record that 38% of the institutions interviewed offer MOOCs to lower the costs as well as to increase revenues. The interviewees believe that offering credit and charging tuition, drawing MOOC participants into existing full-tuition degree programs, increasing class size, earning licensing fee for using MOOC materials and other additional services and training of employers as some of the potential current and future sources of revenue generation by the institutions offering MOOCs. Carrera and Ramírez-Hernández (2018) state that enrolling in certain MOOCs requires a registration procedure and involves cost. If the learner requires a completion certificate, one has to pay the required fee depending upon the reputation of the institution offering courses. Also, the duration of the MOOCs depends on the free access and no-cost courses. Further, the MOOCs providers have to spend a considerable amount of money for maintenance purposes. It was also found that 41% of the institutions (studied) acknowledged that they offer MOOCs as a vehicle to expand their brand and attract students (Hollands & Tirthali, 2014).

The major challenge reported (Atiaja & Proenza, 2016; Chew, 2015; Kesim & Altınpulluk, 2015; Li, 2019; Mohan et al., 2020; Sonwalkar & Maheshkar, 2015; Walker & Loch, 2014) to be associated with MOOCs is low completion rates of courses by the participants. Atiaja and Proenza (2016) documented low completion rates, resulting in 75 % to 95% of students dropping out of the courses. Walker and Loch (2014) highlighted that the success rate of learners completing the courses is reported to be less than 10 % and expressed concerns about the value addition of these courses.

Students enrolled in MOOCs are dropping out due to various reasons, primarily for low motivation and engagement of them (Chew, 2015). Mohan et al. (2020) reported time limits, technical problems, monotonous learning, and less efficacy than traditional learning as the reasons for the low usage of MOOCs. Students reported difficulty managing their time with their regular class schedules to participate effectively in MOOCs. It was found that students' behavioral dispositions like self-control and attitudes played a significant role in using the MOOCs and successfully completing them (Faizuddin & Azeeza, 2015). Further, Hollands and Tirthali (2014) documented that the learners in MOOCs are already well educated; only a small segment of them fully engages with the courses. The MOOCs increase the gaps in access to education rather than decrease them.

In addition, Li (2019) discussed the following reasons for higher dropout rates of students from MOOCs: Problems in satisfying individualized learning needs, failure in updating the course, lack of motivation and self-stimulation, lack of interaction, the mismatch between student's knowledge and their needs and low coverage of credit certificates.

Following the higher dropout rates, MOOCs' assessment and evaluation processes are considered a challenge to the MOOC providers. Kesim and Altınpulluk (2015) claimed that meaningful evaluation of learners is not practiced in MOOCs. Even though advanced learning analytics and peer-reviews are administered during the assessment, they do not have a more comprehensive application. Cabrera and Fernandez (2017) pointed out the pedagogical limitations of MOOCs in terms of continuous internal assessments.

Berrocoso et al. (2014) asserted that MOOCs replicate traditional classroom practices e.g., audio-visual presentations, which encourages students' rote learning and mechanical guess-work assessments. Further, it

focuses on regulating learners' knowledge and follows the same assessment procedure for all the learners irrespective of their inherent differences (Berrocoso et al., 2014).

Designing and delivering online lectures to massive students is possible. Faizuddin and Azeeza (2015) reported the difficulty of teachers associated with evaluating students from all over the world. In Indian context, Abhishek et al. (2025) found issues like cheating during the assessment. Similarly, Sonwalkar and Maheshkar (2015) emphasized the difficulties associated with credibility during examinations and grading of the courses in MOOCs. The MOOC providers adapt technical verification of learners' identities from different geographical locations during online examinations. However, the legal bodies in most countries do not testify to the authenticity of those identities. Even though the traditional evaluation system was criticized as passive means of knowing students' understanding; evaluations done in MOOCs are not exceptional as it faces difficulties owing to a heterogeneous group of learners (Li, 2019).

Kesim and Altınpulluk (2015) highlighted that certain MOOCs do not hold accountable to award formal degrees to the learners or attain credits. Chew (2015) noted accreditation and certification as a significant challenge in MOOCs. So far, no standards have been framed for evaluating the credibility of certifications and courses. Only a handful of institutions are accrediting the courses offered by them. Chatterjee and Nath (2014) noted that the MOOCs providers are often renowned institutions that are few and do not have scope for broader distribution and diversification.

Further, Chatterjee and Nath (2014) observed that the attitudes of acceptance towards formal education are much superior to the courses completed with distance mode and MOOCs. MOOCs' credibility issues have prevented it from being treated on par with the traditional education system. Similarly, the absorption of learners in jobs after completing courses in MOOCs is jeopardized as it does not support a formal award of degrees and accreditation (Kesim and Altınpulluk, 2015).

The other difficulty associated with MOOCs is judging individual differences during the teaching-learning process. The students enrolled in MOOCs involve learners from heterogeneous backgrounds e.g., non-students, new students, final-year students, graduates, and even professionals giving a tough challenge to the teaching methodology (Sonwalkar and Maheshkar, 2015). Also, there is no mechanism available to monitor the students' learning as it is based on the principle of self-learning (Kesim and Altınpulluk, 2015). The courses in MOOCs have many resources that are designed to meet the standard requirements of students, but it is not successful in catering to the needs of the individual learners (Berrocoso et al., 2014). Cabrera and Fernandez (2017) highlighted that MOOCs have limited scope in offering personalized and immediate feedback to their learners. Even though MOOCs provide autonomy to learners to analyse their work and initiate interaction with other students, it does not guarantee students to receive individualized instructions.

As language and culture play a vital role in students' thinking and learning, the same has to be considered by the MOOC providers. Chatterjee and Nath (2014) poised that MOOCs fail to fulfill students' language and cultural requirements. In order to accommodate the vast audience, English is used as a medium of instruction in MOOCs. However, the students who lack adequate fluency in English face problems in understanding the content. Offering the MOOC in regional languages is prone to lack uniformity and quality.

Similarly, Li (2019) reported the failure of MOOCs in not adequately updating the courses. Sonwalkar and Maheshkar (2015) documented the voices of learning practitioners in accepting the value of MOOCs. The practical difficulties related to accessing MOOCs by disadvantaged learners and learners without ICT skills were reported.

The other major disadvantage of MOOCs documented in the literature is that it restricts the learners from contacting and interacting with teachers. The scope for teachers' guidance and support is limited. Further, the students enrolled in MOOCs pointed out that it limits them from collaborating with their peers (Berrocoso et al., 2014).

Sonwalkar and Maheshkar (2015) claimed that learners could only act as passive listeners with MOOCs where only one-way communication is possible from teachers. On the one hand, the teachers cannot give active feedback for assignments and tests of the students. On the other hand, the students cannot interact with teachers and can give feedback about the nature of class (Faizuddin and Azeeza, 2015).

In addition to the lack of interaction during the teaching-learning process, Walker and Loch (2014) noted an imbalance in the demand and supply of the digital resources for the large number of students enrolled while

analysing the quality of MOOCs programs. Carrera and Ramírez-Hernández (2018) noted the requirement of the internet and computer to enroll in the MOOCs apart from possessing basic knowledge and skills in using ICT.

Walker and Loch (2014) documented the limitations of MOOCs in supporting learners in developing countries. They highlighted the lack of infrastructure for basic online learning in non-urban regions. The learners from regions who do not have access to traditional forms of education have not enrolled in MOOCs as per the demographic data. Problems related to language were underlined to be a major reason for zero enrolments of learners from regions where English is not their first language.

Chew (2015) documented the prevalence of digital divides in developing countries that hinder the opportunities for the students to have access to MOOCs. Limitations in the internet infrastructure facilities and lack of technology and tools are obstacles to accessing MOOCs. As most students in developing countries have access to smart mobiles, MOOCs providers are trying to make their learning materials accessible using mobile. However, only a few MOOC providers have made their content accessible using mobile so far.

Further, the learner's level of engagement with ICT has to be taken into account for the successful completion of courses (Kesim and Altınpulluk, 2015). Chatterjee and Nath (2014) indicated the lack of digital literacy among 90% of the Indian population. The digital divide between rural and urban students prevented them from accessing MOOCs without any hindrances. In addition, high internet speed is considered as one of the requisite infrastructures to access MOOCs. However, India was reported to have low internet speed compared to other Asian countries. Similarly, Rajendran et al. (2022) posited the emergence of a deeper digital divide among students with disabilities because of digital inclusion and the emergence of newer innovations in the teaching-learning process.

Educational outcomes are considered as one of the major goals of the MOOC providers. Hollands and Tirthali (2014) recorded that the institutions offering MOOCs have not been actually involved in knowing the MOOCs' impact on educational outcomes. The pedagogy of the courses and the learning materials used in the MOOCs should be carefully chosen. However, the learning materials are copied from existing traditional class notes accompanied with videos that are non-interactive/crude in nature. Further, plagiarized course content and lectures and duplicity of organized classes are some of the reasons raised to question the quality of MOOCs (Walker and Loch, 2014). They reported that the students enrolled in MOOCs were dissatisfied with the quality of materials and videos that are poorly made. Also, the videos are excessively lengthy. Baturay (2015) criticized the MOOCs for being merely the online version of the textbook that failed to enhance learners' higher-order thinking skills.

The major drawback with the pedagogy of MOOCs is the utilization and direct transfer of on-campus materials that do not fit to the online format. MOOCs are like traditional classroom practice where the lecturer will be talking into the camera (Walker and Loch, 2014). In one instance, Walker and Loch (2014) observed that some faculty in the universities were asked to withdraw their courses due to the lack of quality in the materials prepared by them.

Sonwalkar and Maheshkar (2015) underlined the legal issues like intellectual property rights, data protection, public funding, employment, and examinations in MOOCs. The legal evaluation considers target groups (students and general public) and the MOOCs' fee structure (cost-free/chargeable). However, these terms are not clearly defined, causing clear legal classification problems.

The problems related to sustainable development and intellectual property, incomplete courses owing to the mismatch between teaching modes and online course requirements, ambiguity in categorizing the online courses under specific disciplines, failure to meet the needs of the heterogeneous group of learners, excessive focus on technology and neglect of the need for interactions and little attention to the diversity and variation of the teaching process are pointed out by Li (2019).

The other practical issue less addressed in the literature is the teachers' attitudes, knowledge, and skills in offering MOOCs. Sonwalkar and Maheshkar (2015) pointed out that teachers lacking competency in using digital instruction and technologies had compelled the university administration to replace them with administrative personnel to reduce expenditure.

Walker and Loch (2014) addressed the impact of MOOCs on teaching faculty as it is not as exact as teaching in traditional classes. Teachers' locus of control is influenced as some of their roles as lecturers change according to the open nature of MOOCs. In addition, time management is also a significant factor in deciding the teaching and

completion of courses to the vast majority of students—all these influences the job satisfaction of teachers negatively.

The educational institutions offering the programmes in MOOCs platform had either flourished by playing a significant role in marketing or lost their reputation because of technical problems. The authenticity of the credits, course completion certificates, and academic qualifications provided by institutions offering MOOCs have been questioned (Walker and Loch, 2014). These difficulties can be mended effectively. The literature noted some functional strategies that the MOOC providers can follow.

Mohan et al. (2020) suggested that the faculty identify the relevant MOOCs to be embedded in the traditional courses and facilitate blended learning with suitable assessments and time frames to complete the course by the students. Blended learning facilitates interactions with faculty through which they can motivate the students to inculcate self-directed learning.

Li (2019) suggested organizing MOOCs curriculum with due considerations to cultural backgrounds and the practical needs. The institutions should extend their support by offering MOOCs with classroom teaching to enhance the acceptability of courses and playing an active role in fulfilling the learners' needs.

MOOCs suffer from limitations due to problems associated with low completion rates, assessment and evaluation, lack of individualized learning, lack of resources and quality learning materials, and other practical issues. The use of MOOCs as supplements instead of alternatives has to be prioritized during blended learning in the classroom for enhancing students' motivation and engagement (Chew, 2015). Based on the narrative review done, the authors attempted to explore the perception of university students and teachers on the advantages and limitations of MOOCs in the local context and analysed the results with the review.

Justification for the Present Study

Despite the growing popularity of Massive Open Online Courses (MOOCs), there remains a scarcity of qualitative investigations that explore how learners and faculty in Indian higher education perceive their effectiveness. The above literature clearly underlines the paucity of MOOCS research at Indian context and the existing literature emphasizes quantitative metrics such as enrollment and completion rates, leaving a gap in understanding the lived experiences, challenges, and expectations of stakeholders within the Indian university context. This study addresses that gap by drawing on grounded theory to capture nuanced perspectives of both students and faculty members at a central university. Understanding these perceptions is significant because MOOCs represent both opportunities and constraints in the teaching-learning process. On the one hand, they democratize access to high-quality, low-cost, and flexible education; on the other hand, they present challenges such as low interaction, digital divides, limited personalization, and high dropout rates. Examining the pros and cons from the standpoint of actual users offers valuable insights for improving course design, pedagogical strategies, and institutional support systems. Moreover, in a developing country like India, where disparities in digital access persist, such insights are critical for ensuring that MOOCs serve as inclusive and sustainable models of higher education rather than reinforcing existing inequities.

Research Questions

Questions for the research are mainly framed according to three following notions of the study.

RQ1. What are the major advantages of MOOCs in teaching and learning?

RQ2. What are the limitations of MOOCs in teaching and learning?

RQ3. What can be done to improve MOOC modules?

Methodology

The research used the interpretative approach (Corbin & Strauss, 1998) of the Grounded Theory method for collecting and analysing the data. Grounded Theory is a method in the social sciences involving the construction of theories through methodological gathering and analysis of data.

Qualitative data were collected with the help of semi-structured interview schedules developed by the investigators. To ensure content validity, the interview schedules were reviewed by subject experts. Feedback from this pilot process was incorporated to refine the wording, sequence, and clarity of the questions.

The final schedules were administered to both students and teachers of the Central University of Tamil Nadu. Participants were selected using a purposeful and convenience sampling method, necessitated by the constraints of the COVID-19 pandemic, which limited access to a larger and more randomized pool of respondents.

In the first leg of research during the Academic Year 2018–2019, data were collected purposefully from 10 students on volunteer basis, face to face across various departments and levels of education, from undergraduate to postgraduate. In the second and final stage during the Academic Year 2019–2020, in-depth interviews (IDIs) were conducted with 7 professors purposefully from departments (Media and Communication, Microbiology, Epidemiology and Public Health, Library and Information Science, Management, Geography, Education), who had coordinated Massive Open Online Course (MOOC) modules during the academic year, participated in the study. Broad, open-ended questions were asked to elicit a deep understanding of participants' perceptions.

To ensure validity and transparency, several strategies were employed. The investigators minimized researcher bias by maintaining neutrality in questioning, encouraging participants to speak freely, and cross-checking interpretations with respondents when necessary (participant validation). Interview transcripts were coded systematically using sentence-by-sentence analysis, and constant comparison was applied to refine categories and subcategories. This transparency in coding and categorization enhanced the trustworthiness and credibility of findings.

During the interview, the researchers audio recorded took notes and the same was transcribed verbatim. Once interviews were transcribed, major concepts were coded and grouped into categories and sub-categories through open coding. Axial coding was used to link subcategories with their respective categories, followed by selective coding to integrate and refine the central phenomenon. Although the study did not reach full theoretical saturation due to time and resource constraints, the findings represent a robust theoretical scheme rather than a complete grounded theory (Corbin & Strauss, 1998, p. 293).

Data Analysis

Given below is the analysis of data collected from students and academicians of Central University of Tamil Nadu during the Academic Year 2018-19.

Open Coding: *Categories and sub categories* were open coded. Categories/sub categories were analysed in *memo* writing in terms of its properties and dimensions of the phenomenon it represented, conditions that gave rise to it, the action/ interaction by which it was expressed, and the consequences it produced.

Axial Coding: Axial Coding is the coding, or the process of inductively locating linkages between the data. In *axial coding*, through the *coding paradigm* (The phenomenon it represents, conditions which give rise to it, the action/interaction by which it is expressed, and the consequences it produces), *sub categories* are related to their respective *categories*. The *sub categories* are divided as Source, Message, Channel and Receiver under the main categories Advantages, Limitations and Suggestions & Recommendations i.e., *sub categories* 'Source', 'Message', 'Channel' and 'Receiver' were related to *categories* 'Advantages', 'Limitations' and 'Suggestions & Recommendations'.

Selective Coding: *Selective coding* is the process of integrating and refining a theory by unifying all categories under a core-category, which was a central phenomenon of the study. Central category was defined in terms of properties and dimensions.

The categories formulated from the study are: Advantages, Limitations, Suggestions & Recommendations. A central or core category which could unify all categories stated above is: *Effectiveness of MOOCs in Learning*. The findings were presented as a set of interrelated concepts and not just listing of themes.

[Subdivide text into unnumbered sections, using short, meaningful sub-headings. Please do not use numbered headings. Please limit heading use to three levels. Please use 12-point bold for first-level headings, 10-point bold for second-level headings, and 10-point italics for third -level headings with an initial capital letter for any proper nouns. Leave one blank line after each heading and two blank lines before each heading. (Exception: leave one line between consecutive headings.) Please margin all headings to the left.

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Table 1: Showing category (Advantages- Students), its subcategories (Source, Message, Channel and Receiver) and their concepts

Category	Sub-Categories and their Concepts (Students)			
	Source	**Message**	**Channel**	**Receiver**
Advantages	On-demand	Greater clarity	Audio clarity	Learning flexibility
	Time-space independent	Quality content	Video clarity	Learning alternative
	Experienced teachers	Live content	User friendly apps	Access flexibility
	Subject specialists	Repetitive content		Bridging gap
		Multimedia content		Time-Space independence
	Reputed teachers	Structured content		Greater clarity
		Effective content		Additional knowledge
		Negligible cost		Submission ease

Table 2: Showing category (Advantages-Teachers), its subcategories (Source, Message, Channel and Receiver) and their concepts

Category	Sub-Categories and their Concepts (Teachers)			
	Source	**Message**	**Channel**	**Receiver**
Advantages	Experienced teachers	Quality content	User friendly	Open to all
	Time-Space independent	Detailed content	Audio clarity	New experience
	Reputed institutes	Repeated telecast	Video clarity	Understandable
	Reputed host	Variety Q &A		Additional knowledge
	Proven technique	Competitive exam friendly		Clarification source
		Fixed style		Convenient
		Certified course		Flexible
		Quality content		Personal attention
	Quality presentation	Credit system		Student motivation
				Homely environment
				Login pliability
				Self-paced Learning

Table 3: Showing category (Limitations- Students), its subcategories (Source, Message, Channel and Receiver) and their concepts

Category	Sub-Categories and their Concepts (Students)			
	Source	**Message**	**Channel**	**Receiver**
Limitations	Pace of teaching	Content repetition	Uncertainty of reply	Communication
	Assessment schedule	Less infographics		Doubts

	Course cost	Forced participation	Technical glitches	Student presence
	Student interaction			Low priority
	Progress monitoring			Teamwork
				Socialization
				Learning environment
				Technical issues
	Teacher comparison			

Table 4: Showing category (Limitations- Teachers), its subcategories (Source, Message, Channel and Receiver) and their concepts

Category	**Sub-Categories and their Concepts (Teachers)**			
	Source	**Message**	**Channel**	**Receiver**
Limitations	Less interaction	Efficacy concern	Channel literacy	Screen time
	Delayed feedback	Monotony	Availability	Assessment issues
	Instructor deficit	Lacks field experience	Accessibility	Instant feedback
		Compulsory participation	Channel noise	Doubt clearance
		Majority subject selection	Feedback	Class activities
		Information bombardment	Constrained medium	More drop out
		Theory centric		Less interest
				Less serious
				Students' irregularity
				Learning environment

Table 5: Showing category (Suggestions & Recommendations-Students), its subcategories (Source, Message, Channel and Receiver) and their concepts

Category	**Sub-Categories and their Concepts (Students)**			
	Source	**Message**	**Channel**	**Receiver**
Suggestions and Recommendations	Encouragement	Pace	Individual interaction	Syllabus-courses
	Information	Rural awareness	Technical improvement	Course variety
	Continuous assistance	Multilingual		Offline-online linkage
	Skill based courses			
	Instructor variety			
	Wider awareness			

Table 6: Showing category (Suggestions & Recommendations- Teachers), its subcategories (Source, Message, Channel and Receiver) and their concepts

Category	**Sub-Categories and their Concepts (Teachers)**			
	Source	**Message**	**Channel**	**Receiver**
Suggestions and Recommendations	Improved guidelines	Interesting content	Improved interaction	Access to instructors
	Curriculum centric	Time management	Channel fidelity	Remedial lectures

	Availability	Feedback process	Poor student assistance
	Improved presentation	Easy study materials	MOOCs awareness
	Course selection	More infographics	Practical learning
	Assessment scheduling	Multilingual	Online-offline linkage
	Supplementary exams		
	Local mentors		
	Technical support		

Discussions and Conclusions

The present study's findings show significant advantages of MOOCs as they provide access to courses with high quality course materials with a user-friendly, systematic approach to content accessibility and delivery along with an opportunity to self-paced learning among students at any time and place. This echoes and further strengthens the research findings of Walker and Loch (2014), Gaebel (2013), Chew (2015), Vázquez-Cano et al. (2021) and Hollands and Tirthali (2014).

The students in the current study praise the quality of the content and its various delivery methods with the orderly arrangement of the videos and study materials. Teachers find negligible ambiguity in the content delivery that may have resulted from the contents' systematic arrangement as perceived by students. This gets support from Downing (1994) who finds that 'advance organizer models of teaching' helps teachers convey vast amounts of information as effectively and meaningfully as possible while enabling students to learn and retain the content. Further, critical thinking is essential for students to solve problems and have good reasoning skills. Teachers of the present study claim that the Question-and-Answer sessions in between lectures support this. Further, the teachers proclaim that MOOCs allow students to learn in a familiar, stress-free, relaxed environment getting parental support when needed. However, this needs further probing as several domestic factors may influence students' learning.

The limitations of MOOCs, as reported by teachers and students, are lack of interaction, excessive strain on eyes, less awareness of courses being offered, slow pace of teaching, problems related to assessment, dependency on internet speed, and high dropout rates. Both teachers and learners deplore over lack of high-speed internet connectivity, which the literature suggests is a crucial prerequisite for using MOOCs (Carrera & Ramírez-Hernández, 2018; Chatterjee & Nath, 2014). According to a constructivist viewpoint, students learn more when interacting actively during teaching-learning. However, teachers and students point out lack of sufficient student interaction as a major limitation, which precludes the possibility of constructivism. Teachers also mention lack of sufficient student feedback. The students' lack of participation and feedback make it challenging for the teachers to determine their level of understanding.

Teachers also point out other drawbacks of MOOCs, including a lack of experiential learning, inadequate assignments, lengthy, interesting lectures, discursive study materials, physical discomforts like eye strain, a lack of continuous internal assessments, and the mere administration of summative assessments. The authors assume that all these elements may have contributed to the high student dropout rates. Similar issues such as lack of interaction, a lack of motivation, and a lack of self-stimulation among students are flagged off by Li (2019) as contributing factors to the high dropout rates.

Regarding the students' learning experiences, it is noted that the teaching process is slow, doubts are not often answered, information repeated, fewer infographics are used, and ad hoc assessment schedules are implemented. The forced enrollment of students in some courses is also reported by teachers and students alike. The authors believe this may be because of a lack of interest and competency among teachers. Teachers have also noted lower course enrolment due to students' unawareness of courses.

In addition to the merits and the limitations of MOOCs, the students recommend and suggest creating interaction, availability of courses in multiple languages, continuous assistance, availability of multiple course instructors for a better selection, skill and need-based courses, facilitating devices free of cost to access content among other recommendations and suggestions. In the opinion of both teachers and students, the scope of interaction in MOOCs should be increased. The authors opine this is doable with web-based tools (Vázquez-Cano et al., 2021). Additionally, courses should be offered in various languages to address diversity for better understanding, as students and teachers report that non-English speaking students struggle to understand the courses offered only in

English (Chatterjee & Nath, 2014). In order to address this problem, the authors poise that the same shall be accomplished by hiring linguists who can create subtitles in various regional languages. The students also advocate for having more than one course instructor in each course so that they could pick the one who best suits their requirements. They also emphasize the necessity of orientations to raise awareness of various courses and their importance.

The results highlight a strong demand from both students and faculty for greater support structures and pedagogical innovations in MOOCs. The call for a round-the-clock support system and the inclusion of local mentors, especially in rural areas, underscores the persistent challenges of accessibility and contextualization in the Indian higher education landscape. This suggests that while MOOCs are designed for mass delivery, they often overlook localized learner needs, particularly those of students from non-urban and resource-constrained environments. Such findings resonate with the critique that MOOCs, in their current form, may inadvertently widen rather than close digital and pedagogical divides (Chatterjee & Nath, 2014).

The recommendation for quicker pacing of instruction indicates that learners perceive certain MOOCs as monotonous or excessively lengthy, which aligns with earlier research pointing to disengagement and high dropout rates (Li, 2019). However, this must be interpreted cautiously: while some learners prefer faster delivery, others may struggle without opportunities to revisit content. This tension reflects the broader challenge of personalization in MOOCs.

The endorsement of flipped classrooms and blended learning provides a promising way forward. Blended approaches have been widely recognized (Chew, 2015; Mohan et al., 2020) for balancing the flexibility of online learning with the interaction and feedback of face-to-face teaching. However, the feasibility of implementing blended models in India depends on institutional commitment, teacher training, and adequate infrastructure. Without these, blended learning risks becoming another aspirational reform rather than a practical solution. This finding illustrates that MOOCs, while offering access and flexibility, require structural, pedagogical, and contextual reinforcements to ensure meaningful engagement. The emphasis on mentorship, pacing, and blended models reflects an urgent need to move MOOCs from a one-size-fits-all paradigm toward inclusive, adaptive, and sustainable designs.

In order to improve interaction and feedback during instructional time, instructors suggest creating captivating videos and activity-based sessions. The teachers also suggest a concise but high standard study materials to enhance students' interest. Further, the teachers find students' difficulty participating in MOOCs without owning digital devices (Chew, 2015; Walker & Loch, 2014) and suggest giving them away for free to encourage MOOC participation.

It is important to note that while MOOCs have limitations, they continue to evolve, and advancements in technology and pedagogy can address some of these concerns over time. The authors propose that the content of MOOCs needs to be validated against several quality criteria, and teachers' competency should be improved by imparting necessary training to develop and offer MOOCs along with participating in meaningful evaluation.

Limitations and Suggestions for Future Research

While the present study provides valuable insights into the perceptions of students and faculty on the effectiveness of MOOCs, certain methodological and contextual limitations must be acknowledged. First, the study employed a relatively small sample size (10 students and 7 faculty members) from a single institution, limiting the generalizability of the findings. The use of convenience sampling, necessitated by the COVID-19 pandemic, may have introduced selection bias, as participants who were accessible and willing might not fully represent the wider university community. Furthermore, although grounded theory was adopted, theoretical saturation was not achieved due to time and resource constraints. As a result, the categories and themes developed should be regarded as a theoretical scheme rather than a complete theory. In addition, reliance on self-reported interviews raises the possibility of recall bias or socially desirable responses, especially given that participants were reflecting on MOOCs coordinated within their own university context.

The findings are also limited by the institutional scope of the study, as it reflects the experiences of a single central university in Tamil Nadu. Factors such as institutional culture, infrastructure, and faculty preparedness may differ significantly across other contexts. Moreover, the study focused on perceptions rather than measurable learning

outcomes such as skill development, employability, or academic performance. The pandemic context may also have amplified participants' sensitivity to online learning challenges, which may not be as pronounced in normal conditions.

Future research should address these gaps by incorporating larger, more diverse samples across multiple institutions and regions to enhance representativeness. Mixed-methods approaches that combine qualitative perspectives with enrollment, completion, or performance data would provide a more comprehensive understanding. In particular, future studies should examine the practical implementation of blended and flipped learning models, explore the impact of local mentorship and multilingual support, and assess how digital divides and socio-economic inequalities influence access to MOOCs. Such inquiries would strengthen the evidence base for designing inclusive and sustainable online learning in higher education.

Author (s) Contribution Rate

All authors contributed equally to the completion of the work.

Ethical Approval

The study was conducted in accordance with necessary ethical procedures, where informed consent was obtained from all participants prior to data collection and no sensitive information was elicited from the study participants.

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