**Awareness of MOOCs Among Secondary-Level Teacher Trainees: A Cross-Sectional Study from India**

**Abstract**

Massive Open Online Courses (MOOCs) are emerging as essential tools in teacher education. However, limited empirical evidence exists on the extent of MOOC awareness among secondary level teacher trainees in India. This study addresses that gap by examining the awareness levels of 259 B.Ed. students in Mysore through a structured Awareness Test spanning five domains: usability, technological requirements, policy knowledge, present practices, and conceptual understanding. The study adopted a cross-sectional survey design and the sample of the study were chosen using stratified random sampling. Data were analyzed descriptive and inferential statistics. Findings revealed that while 63.71% of participants exhibited moderate awareness of MOOCs, critical knowledge gaps persisted in policy guidelines and platform-specific details. Female participants demonstrated significantly higher awareness of student support mechanisms and familiarity with SWAYAM initiatives. Science stream students outperformed humanities peers in technical aspects, whereas humanities students better understood the pedagogical contrasts between MOOCs and traditional methods These insights suggest an urgent need for integrating foundational MOOC modules into pre-service teacher training. The study contributes to understanding digital readiness in teacher education and offers actionable recommendations for policymakers and institutions aiming to promote equitable and informed use of online learning platforms.

**Keywords**: Awareness, Digital Readiness, MOOCs, SWAYAM, Teacher Education

**INTRODUCTION**

The landscape of education has undergone a significant transformation with the advent of digital learning platforms. Among these innovations, Massive Open Online Courses (MOOCs) have emerged as a revolutionary educational paradigm that transcends traditional classroom boundaries. These online courses are designed to accommodate unlimited participation and provide open access to education via the internet (Ayoub et al., 2020). The evolution of MOOCs represents a pivotal shift in educational delivery methods, offering learners worldwide unprecedented access to knowledge from renowned institutions and educators.

In the Indian context, MOOCs have been implemented to democratize education and to reduce the rural-urban divide. These platforms host many courses that are open for anyone to access and are usually provided by the top universities. These are free-of-cost courses, and they also provide a certificate on completion for a nominal fee. Platforms that provide MOOCs in India include SWAYAM, NPTEL, Coursera, Upgrad, and Khan Academy to name a few. The major advantages that these platforms offer are accessibility, affordability, flexibility, lifelong learning, and skill development. The digital divide, language barrier, lack of motivation, and under recognition of these courses are some of the challenges that students face when taking a MOOC course.

To ensure a higher participation of students in MOOCs, the Government of India has brought in certain initiatives and policies. The National Education Policy (NEP) 2020 promotes the usage of technology in higher education, and the credit transfer system of SWAYAM helps learners to earn academic credits. The Digital India and PM eVidya are initiatives that support digital learning and infrastructure development.

Despite these developments in digital education, the usage and awareness among teacher trainees are limited and underexplored. Therefore, the present study aims to fill this gap by understanding the awareness levels among the teacher trainees of Mysore city.

**CONCEPTUAL FRAMEWORK**

The study examines how demographic characteristics and domain-specific knowledge influence the awareness of Massive Open Online Courses (MOOCs) among secondary grade teacher trainees, ultimately influencing their adoption. Even though the study was not directly based on any theoretical model, its findings and structure align with two recognized frameworks, such as the Technology Acceptance Model (TAM) (Davis, 1989) and Diffusion of Innovations Theory (Rogers, 2003).

These models suggest that technological advancements follow a structured pattern of awareness, followed by their evaluation, and finally accepting or rejecting their adoption. The TAM, in particular, talks about the role of perceived usefulness and ease of use as mediators of technology acceptance, factors partially reflected in this study’s findings based on usability, technological requirements, and policy guidelines.

The framework developed here, however, is empirical and tailored specifically to teacher trainees in the Indian context. It comprises demographic variables such as gender (male, female) and stream of study (science, humanities); awareness domains including conceptual understanding (knowledge of MOOCs as a concept), usability (perceived convenience and accessibility), technological requirements (awareness of internet, devices, and digital tools), present practices (engagement or familiarity with MOOCs), policy guidelines (knowledge of national-level initiatives and institutional efforts).

The five domains are envisioned as interconnected elements influencing a participant's comprehensive understanding of MOOCs. This understanding is recognised as an essential prerequisite for significant digital participation, especially within the realm of teacher education and professional development. The study does not investigate behavioural outcomes like MOOC enrolment or course completion; nonetheless, the incorporation of usability, policy guidelines, and present practices as domains serves as a proxy for potential future adoption, as articulated in wider technology adoption theories.



**Fig 1-Conceptual Framework for MOOC Awareness Among Teacher Trainees**

This paradigm facilitates the empirical evaluation of how gender and academic stream affect MOOC awareness across five conceptual domains, employing a validated and reliable awareness assessment specifically designed for the teacher education environment.

**REVIEW OF RELATED LITERATURE**

Massive Open Online Courses (MOOCs) have emerged as flexible and scalable alternatives to traditional education, providing open access to quality learning resources. However, awareness and usage patterns of MOOCs vary significantly across countries, learner groups, and academic disciplines, particularly within the context of teacher education.

In many developing countries, MOOC awareness remains low despite increasing internet access. Muzafarova and Kaya (2014) found that over 60% of Georgian university students had never heard of MOOCs. Similarly, Shakya et al. (2016) reported that 81% of students in Nepal lacked awareness of major platforms like Coursera and edX. Muhammad et al. (2016) noted that Nigerian students from non-technical backgrounds had limited exposure to MOOCs, reflecting disparities in digital engagement.

More recent studies confirm that these challenges persist. White and Panyawongngam (2025) observed low familiarity with both benefits and providers of MOOCs among Thai undergraduates. Macugay et al. (2025) found moderate awareness levels in Philippine higher education, shaped by teaching experience, academic stream, and digital infrastructure. These findings highlight that even in moderately connected environments, institutional support and learner motivation are essential for meaningful MOOC engagement.

India has promoted MOOCs through platforms like SWAYAM and NPTEL, aligned with the objectives of the National Education Policy (NEP) 2020. Yet, several studies suggest that awareness, especially in teacher education, remains uneven. Singh and Chauhan (2017) reported that teacher educators were aware of MOOCs but lacked understanding of their structure, certification, and policy integration. Shaikh (2017) similarly noted that student teachers had digital access but lacked clarity about MOOCs’ relevance to professional growth.

Mondal and Parhi (2024) found that only 39.5% of B.Ed. and M.Ed. students across Indian universities were aware of SWAYAM. Their study revealed that institutional type (central vs. state or private) and access to infrastructure (Wi-Fi, ABC ID) significantly influenced awareness and enrolment. Singh and Bhandari (2025) reported that while awareness of government MOOCs was moderate, usage remained low due to time constraints, internet issues, and limited institutional promotion. Other Indian studies (e.g., Giri & Majhi, 2024; Mandal & Yadav, 2024; Purkayastha & Sinha, 2021) emphasize the importance of structured orientation and integration of MOOCs into the curriculum to improve adoption among teacher trainees.

Demographic and academic factors play an important role in shaping MOOC awareness. Singha and C.A. (2024) and Patwardhan and Yadav (2022) found higher awareness among male learners and those in science and commerce disciplines, whereas Shaikh (2017) reported that female student teachers were more attuned to learner support and pedagogical aspects of MOOCs. Macugay et al. (2025) further observed that academic discipline and teaching experience influenced awareness, with business and technology fields outperforming others.

Theoretical perspectives such as Rogers’ Diffusion of Innovations and Deci and Ryan’s Self-Determination Theory have been applied to explain how factors like intrinsic motivation, prior exposure to technology, and institutional culture influence MOOC adoption (Macugay et al., 2025). These frameworks support the argument that awareness is a multi-dimensional construct shaped by both individual and systemic variables.

***Research Gap:*** Although MOOC awareness has been studied extensively in the Indian context, limited research focuses on B.Ed. students preparing for secondary-level teaching, a group critical to future digital learning implementation in schools. Most existing studies focus on postgraduate learners or in-service faculty, often without distinguishing between awareness domains. Moreover, few studies employ a domain-specific framework for understanding MOOC awareness, incorporating aspects like conceptual knowledge, usability, technological requirements, policy awareness, and present practices. This study addresses that gap by examining awareness among teacher trainees in Mysore city, with particular focus on gender and academic stream. In doing so, it contributes to the broader discourse on teacher readiness and digital inclusion in Indian education.

**OBJECTIVES OF THE STUDY**

The objectives of the study are –

1. To determine the level of awareness among the teacher trainees of MOOCs.
2. To compare the awareness of MOOCs among male and female teacher trainees of Mysore city.
3. To compare the awareness of MOOCs among teacher trainees belonging to stream of science and humanities of Mysore city.

The objectives of the present study were formulated in direct response to the persistent gaps identified in both national and international literature regarding MOOC awareness among pre-service teacher trainees. While the proliferation of MOOCs has been supported by policy-level initiatives in India, including NEP 2020 and platforms such as SWAYAM, empirical studies continue to report limited awareness, especially in teacher education contexts. The first objective—to assess the overall level of awareness—was designed to establish a foundational understanding of how familiar secondary-level teacher trainees are with various dimensions of MOOCs, including usability, technological requirements, policy frameworks, and current practices. The second and third objectives—comparing awareness by gender and academic stream—were developed based on repeated findings in prior studies that indicate demographic and disciplinary variables play a significant role in shaping digital engagement. By incorporating these comparative objectives, the study aimed to unpack how individual-level characteristics may influence the readiness of future educators to adopt and integrate MOOCs into their professional practice.

**METHODOLOGY**

***Research Design:*** This study adopted a quantitative research design employing a cross-sectional survey method to examine the awareness of teacher trainees regarding Massive Open Online Courses (MOOCs). The cross-sectional approach was selected for its efficacy in capturing self-reported awareness levels and enabling comparative analysis across diverse demographic groups within a defined population at a single point in time. The conceptualization of the study commenced in January 2024. A comprehensive review of related literature was undertaken between January and May 2024, ensuring the inclusion of all relevant, accessible, and current scholarly works to accurately identify and establish the research gap. Informed by the literature review and a series of in-depth discussions among the authors, a structured survey instrument was developed during June and July 2024. To ensure content validity, the draft instrument underwent expert evaluation in August 2024. Based on expert feedback, the tool was refined and subsequently pilot tested in September 2024. The results of the pilot study were used to assess the reliability and further improve the validity of the instrument. Final revisions were made accordingly. The validated and reliable instrument was administered to the target sample population in December 2024, marking the completion of the data collection phase. The data analysis, reporting and bringing the paper to final form took time till June 2024.

***Population and Sample:*** The population of a study were all the teacher trainees studying in the B.Ed. Colleges (both government and private) approved by NCTE, recognized by the Government of Karnataka, and affiliated to the University of Mysore. Disproportionatestratified random sampling was used to select the sample for the present study. The sample included 259 teacher trainees of 2 private and 1 government B.Ed. institutions of Mysore city were selected randomly. The sample of 259 teacher trainees comprised of 58 males and 201 females and 137 of them belonged to humanities stream and 122 belonged to science stream.

***Tool Description:*** This study employed a primary quantitative data collection instrument: an Awareness Test.

1. ***Awareness Test:*** The awareness test was designed to measure the knowledge and understanding of teacher trainees regarding various aspects of Massive Open Online Courses (MOOCs). The test consisted of 20 multiple-choice questions (MCQs) distributed across five conceptual domains: conceptual understanding, usability, technological requirement, present practices, and policy guidelines. Each correct response was awarded one mark, with total scores ranging from 0 to 20. Awareness levels were categorized as low, moderate, or high based on standard deviation-based cutoffs.
2. ***Validity and Reliability:*** Content validity was ensured through expert review and careful item selection. The original 36-item tool was reduced to 20 focused questions across five domains, eliminating redundancies while retaining key concepts. The reliability of the Awareness Test was assessed through a pilot study involving a sample of 50 teacher trainees. Cronbach’s alpha coefficient for the pilot study was calculated to be 0.839, indicating a high level of internal consistency and reliability of the tool. Following revisions based on the pilot testing, the instrument was administered to the final sample of 259 teacher trainees, yielding an improved Cronbach’s alpha of 0.87. This enhancement suggests that the reliability of the tool increased after refinement, thereby confirming its robustness for large-scale data collection.

***Data Collection:*** Permission was obtained from the heads of the participating institutions. Data were collected during in-person visits using a Google Forms–based questionnaire administered on digital devices. Participation was voluntary, and confidentiality of responses was ensured.

***Data Analysis:*** The responses collected through the awareness instrument were analyzed using SPSS and Microsoft Excel. For the first research objective, which aimed to assess the overall awareness levels of teacher trainees regarding MOOCs, percentage analysis and descriptive statistics (means, standard deviations) were employed to summarize the data effectively. To address the second and third objectives, which involved comparing awareness levels across different demographic groups, independent samples t-tests were conducted to determine the statistical significance of the observed differences. A significance threshold of p < .05 was adopted for all inferential analyses. In addition to statistical significance, Cohen’s d was calculated to evaluate the practical significance of the differences, providing insight into the magnitude of the effects observed.

**ANALYSIS AND RESULTS**

This section provides the findings arranged according to the three research objectives.

**Research Objective 1 -** To determine the level of awareness among the teacher trainees towards MOOCs.

Descriptive statistics were used to assess the overall awareness of secondary-grade teacher trainees towards MOOCs. The results revealed a mean score of 14.22 with a standard deviation of 4.4. Based on this distribution, awareness levels were categorized as low awareness (scores below 9.82), moderate awareness (scores between 9.82 and 18.62), and high awareness (scores above 18.62). Table 1 represents the distribution of participants according to the awareness levels.

**Table 1**

*Distribution of Awareness Levels Among Teacher Trainees (N = 259)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Awareness Category | Score Range | Number of Respondents | Percentage | Interpretation |
| High Awareness | > 18.62 | 47 | 18.15% | > 1 SD above the mean |
| Moderate Awareness | 9.82 and 18.62 | 165 | 63.71% | Within ±1 SD of the mean |
| Low Awareness | < 9.82 | 47 | 18.15% | > 1 SD below the mean |

The majority of participants (63.71%) fell into the moderate awareness category. Interestingly, an equal proportion of respondents (18.15%) exhibited high and low awareness. This symmetrical distribution indicates that while a substantial number of teacher trainees possess a fair understanding of MOOCs, a significant segment remains at both extremes—either highly informed or minimally aware.

**Research Objective 2 -** To compare the awareness of MOOCs of male and female teacher trainees of Mysore city.

An independent samples t-test was conducted to compare awareness scores between male (n = 58) and female (n = 201) participants.

* Male: M = 13.26, SD = 4.24
* Female: M = 14.50, SD = 4.42

The mean difference was not statistically significant, t (257) = 1.90, p = .059, indicating that overall awareness levels between both genders were similar. However, the domain-wise analysis revealed statistically significant differences in specific areas. These are summarized in Table 2.

**Table 2**

*Domain-wise Gender Comparison*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Domain** | **Male Mean** | **Female Mean** | **t-value** | **p-value** | **Cohen's d** | **Significant** **Difference** |
| **Conceptual Understanding** | 0.69 | 0.79 | 2.754 | <0.05 | 0.37 | **Yes** |
| **Usability** | 0.71 | 0.76 | NS | >0.05 | - | **No** |
| **Technological Requirements** | 0.68 | 0.73 | NS | >0.05 | - | **No** |
| **Present Practices** | 0.64 | 0.68 | 2.005 | <0.05 | 0.30 | **Yes** |
| **Policy Guidelines** | 0.58 | 0.66 | 2.442 | <0.05 | 0.35 | **Yes** |

Female participants scored significantly higher in Conceptual Understanding, Present Practices, and Policy Guidelines, with small to moderate effect sizes.

**Research Objective 3 -** To compare the awareness of MOOCs of teacher trainees belonging to science and humanities stream of Mysore city.

An independent samples t-test was conducted to compare awareness scores based on academic stream.

* Science: M = 14.31, SD = 4.25
* Humanities: M = 14.14, SD = 4.54

The difference was not statistically significant, t (257) = 0.315, p = .753. However, domain-specific analysis revealed significant differences in two areas, as shown in Table 3.

**Table 3**

*Domain-wise Stream Comparison*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Domain** | **Humanities Mean** | **Science Mean** | **t-value** | **p-value** | **Cohen's d** | **Significant****Difference** |
| **Conceptual Understanding** | 0.78 | 0.79 | NS | >0.05 | - | **No** |
| **Usability** | 0.74 | 0.77 | NS | >0.05 | - | **No** |
| **Technological Requirements** | 0.72 | 0.80 | 2.038 | <0.05 | 0.41 | **Yes** |
| **Present Practices** | 0.70 | 0.66 | -2.179 | <0.05 | 0.36 | **Yes** |
| **Policy Guidelines** | 0.66 | 0.68 | NS | >0.05 | - | **No** |

Science stream students scored significantly higher in Technological Requirements, while humanities students scored higher in Present Practices, with small-to-moderate effect sizes.

**Summary of Key Statistical Findings**

* Overall awareness was moderate for most students (M = 14.22).
* No significant overall difference in awareness between genders or streams.
* Female students scored significantly higher in student support and policy-related domains.
* Science students showed better technical understanding; humanities students better appreciated pedagogical contrasts.

**DISCUSSION**

This study explored the awareness of Massive Open Online Courses (MOOCs) among secondary-grade teacher trainees, with attention to differences based on gender and academic stream. The findings contribute to the growing discourse on digital readiness and professional development in Indian teacher education.

**MOOC Awareness Levels Among teacher trainees**

The majority of participants in this study demonstrated moderate awareness of MOOCs, with relatively balanced proportions at the low and high ends of the spectrum. This pattern aligns with prior studies in the Indian context, such as those by Shaikh (2017) and Singh and Chauhan (2017), who noted limited understanding of MOOC structures, certification mechanisms, and pedagogical integration among teacher trainees. The findings also resonate with international studies. Muzafarova and Kaya (2014), and Shakya et al. (2016), documented low awareness in Georgia and Nepal, respectively. More recently, Mondal and Parhi (2024) reported that only 39.5% of teacher education students in Indian universities were aware of SWAYAM MOOCs, highlighting persistent gaps in platform familiarity, certification options, and course navigation. Similarly, White and Panyawongngam (2025) found low MOOC awareness among Thai undergraduates despite widespread digital access.

These findings suggest that while digital access is growing, comprehensive understanding and engagement with MOOCs remain limited. This points to a pressing need to reevaluate how MOOCs are introduced within pre-service teacher education programs, particularly in terms of structured orientation and curricular alignment.

**Gender-Based Differences in MOOC Awareness**

Although overall awareness levels did not differ significantly between male and female participants, domain-specific differences were observed. Female participants scored higher in conceptual understanding, present practices, and policy knowledge. These results are consistent with earlier observations by Shaikh (2017), who found that female teacher trainees were more attuned to support mechanisms and the pedagogical value of MOOCs. Macugay et al. (2025) similarly emphasized that institutional experience and teaching exposure influenced MOOC awareness levels, particularly among faculty. The current findings suggest that gendered patterns of digital engagement may not be uniform and that female pre-service teachers may be more receptive to the educational potential of MOOCs when properly introduced.

**Academic Stream-Based Differences**

While no significant difference emerged in overall awareness between science and humanities students, domain-specific variations were evident. Science stream participants scored higher in technological requirements, whereas humanities students performed better in present practices. These results support earlier studies by Patwardhan and Yadav (2022), who found that technical disciplines generally reported higher MOOC familiarity, particularly with platform navigation and digital tools. Macugay et al. (2025) also observed greater awareness among students in business and technology fields, indicating that academic culture and curriculum exposure play a role in digital platform familiarity.

**Implications for Teacher Education**

The findings of this study point to critical gaps in the way MOOCs are integrated—or not integrated—into teacher training programs. Participants demonstrated only partial awareness of domain-specific MOOC features, reflecting an incomplete picture of how such platforms function or how they might be used for professional development. These results echo calls from Singh and Bhandari (2025) and Mondal and Parhi (2024), who emphasized that awareness alone does not translate into meaningful adoption. They identify time constraints, infrastructure challenges, and lack of institutional support as major deterrents to consistent engagement. These challenges persist even among students who view MOOCs as high-quality and professionally relevant.

As a result, teacher education institutions should adopt a more systematic approach to MOOC integration. This includes embedding MOOC navigation and course participation within the curriculum, clarifying credit transfer and certification systems, and ensuring that students are aware of national-level initiatives like SWAYAM and the Academic Bank of Credits. Moreover, orientation programs and mentorship can help demystify MOOCs and foster a culture of digital engagement among future educators.

**Limitations and Future Directions**

This study was limited to B.Ed. students in Mysore city belonging to science/humanities stream, and findings may not generalize to other regions, academic streams and teacher trainees belonging to educational levels other than secondary level. The use of a quantitative awareness test, while valid and reliable, does not capture students’ actual usage behaviour or perceptions of MOOC effectiveness. Future research could incorporate qualitative methods to explore learner attitudes, institutional barriers, and motivational factors in greater depth. Longitudinal studies could also examine how awareness evolves during the teacher training process and whether it leads to actual adoption and integration in professional practice.

**Suggestions for Future Research**

Future studies could:

* Employ mixed methods to explore perceptions, attitudes, and motivations toward MOOCs
* Investigate the impact of MOOC usage on teaching competencies or digital readiness
* Conduct longitudinal studies to track changes in awareness and usage over time
* Compare MOOC awareness across rural vs urban teacher education contexts or teacher trainees belonging to different disciplines.

**CONCLUSION**

This study examined the awareness of Massive Open Online Courses (MOOCs) among secondary-grade teacher trainees, focusing on domain-specific knowledge and differences by gender and academic stream. The results revealed that while a majority of participants demonstrated moderate awareness, substantial gaps persist in their understanding of policy features, certification processes, technological requirements, and present practices. These findings align with national and international research that highlights the gap between digital access and meaningful engagement with MOOCs (Mondal & Parhi, 2024; White & Panyawongngam, 2025).

Domain-wise variations in awareness based on gender and academic stream were also observed. Female participants exhibited greater understanding in areas such as policy knowledge and pedagogical relevance, while science stream students scored higher in technological requirements. These results are consistent with earlier research showing that institutional support, academic discipline, and teaching exposure significantly influence MOOC awareness (Macugay et al., 2025; Patwardhan & Yadav, 2022).

Despite government-backed platforms like SWAYAM and widespread internet connectivity, awareness among future teachers remains fragmented. As noted in studies by Singh and Bhandari (2025), infrastructural barriers, time constraints, and a lack of curriculum alignment continue to limit actual usage, even among students who view MOOCs positively. This reinforces the need for targeted efforts to move beyond superficial awareness toward structured adoption.

To address these gaps, teacher education institutions should integrate MOOC training within the formal curriculum, provide orientation programs on platform usage and credit systems, and create space for hands-on engagement with digital learning tools. Institutional incentives and mentorship models can also help foster long-term digital readiness among pre-service teachers.

In sum, while MOOCs offer significant potential for enhancing teacher education, their impact will remain limited unless awareness is matched by structured support, institutional clarity, and sustained curricular integration. This study contributes to this discourse by providing a domain-based understanding of MOOC awareness among future teachers and offers actionable pathways for bridging the gap between access and adoption.

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