Original Research Article

MOOCs: Unbridling the landscape of Higher Education

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ABSTRACT:

Aims: Advancement and integration of technology in education made a dramatic change in the landscape of teaching-learning process. Massive Open Online Course (MOOC) as one of the emerging trends in education removed the barriers of time, space and pace throughout the world. Diverse lifelong learners irrespective of social, cultural, economic, age, gender identity are participating in melting pot of MOOC. This study aimed to explore the present landscape of the participation and completion rate in MOOCs by the learners from formal educational institutions in the eastern part of India specifically in West Bengal. The research also aimed to identify the underlying causes of the present landscape.

Place and duration of study: The study was conducted among the learners who enrolled in different programs in different Higher Education Institutions (HEIs) during the end of 2023.

Methodology: A self-administered questionnaire in Google forms were used to collect data from the learners. Total 298 samples have been collected.

Results: The study depicted poor enrolment as well as completion rate in MOOCs among the learners. Lack of awareness and huge pressure of present curriculum was the main factors behind non-enrolment. SWAYAM was the most popular MOOC platform among the students of West Bengal. Attaining knowledge, enhancing skill and earning certificates were the main intentions of the students who enrolled in MOOCs. Lack of time, affordability, and in-person proctored examination, non-cooperation of facilitators, length of courses, and uninteresting discussion forum were the major constraints to complete the MOOCs for the enrolled learners.

Conclusion: Organizing awareness building programs, institutional policy framing, incorporating credit transfer system into enrolled courses may be emphasized as immediate initiatives for re-thinking the present opportunities and challenges in the higher education.

Key words: MOOCs, Higher Education Institutions, learners, participation, completion

INTRODUCTION:

Distance learning is an opportunity to the students who are being enthusiastic for education but separated by distance [1]. Massive Open Online Courses (MOOCs) show their prominent growth under the field of distance education of the higher education sector [2]. India takes the second largest position regarding increase rate of enrolment in MOOCs in the recent year [3]. These courses are providing excellent educational resources without considering the social and geographical boundaries [4]. The MOOC was first introduced by George Siemens and Stephen Downs in 2008 through 'Connectivism and Connective Knowledge' [5]. These very online courses are structured for a large number of participants from anywhere as long as they have internet accessibility [6]. The MOOC is purely an online and free offered course and not a single element of this course has not other than the online execution. If this course contains any slightly different form of elements rather than its online nature then the course is termed as a hybrid or blended course. The nature of openness of MOOC secures free access; it does not mean that it has free accessibility. Though there is no need of prerequisite qualifications, entrance examinations, interviews, or tuition fees for a MOOC, still there are lot of barriers that exist like language, digital literacy, bandwidth, etc. to secure participation in it. [7].

MOOCs are mainly two types, one is cMOOCs and another is xMOOCs. The cMOOCs or connectivist Pedagogy based MOOCs developed on harnessing the utility of social and participatory media [5]. It is a peer-learning model [2]. There is no official evaluation procedure but informal feedback or self-assessment may be arranged by the participants [8]. On the other hand, xMOOCs are guided by the behaviourist pedagogical approach [5]. The xMOOCs focus on content-based lectures, video presentations, tests and tasks as main course of learning [9]. These types of courses foster individual learning instead of peer learning [5]. In this course, there is an opportunity of students' assessment by the teacher (s) through different approaches [10]. There are other two types of MOOCs; one is Blended MOOCs or bMOOCs and Small scale MOOCs or sMOOS [11].

Professional MOOCs are maximum interest area of the enrolled students but a large number of student hobby learners [2]. Kate S. Hone and Ghada R. El Said (2016) explored in their study that though no significant differences exist in completion rates by gender, level of study (undergraduate or postgraduate) or platform but the retention rate in MOOC is very low [4]. M. Badali and others (2022) found that the dropout rate is very high in MOOCs. To minimize the dropout rate author analysed the role of motivation. This study shows that the academic motivation has highest influences on the retention of the student in MOOCs [12]. Syed Munib Hadi & Rebecca Rawson (2016) argued that there was high dropout in MOOC completion but the retention and engagement was the effects of consistent and structured support [13]. H. Khalil and M. Ebner (2014) emphasised that different causes like lack of time, motivation, interactivity in MOOCs and feelings of isolation, insufficient previous knowledge and skills, and hidden costs are the guiding factors of the low retention in MOOCs [14]. Chris Parr (2013) also found that the retention rate in MOOCs is very low and the completion rate is less than seven percent [15]. Andrew Ho & et al. (2014) quantified that the MOOC completion rate is five percent [16]. S. Jiang & et al. (2016) explored that female students have high completion rate of STEM MOOCs than the male students [17]. Christoph Meinel & et al. (2014), draw a conclusion of their study that there was no significant differences based on gender but significant difference exist by age group in the completion of MOOCs [18].

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RATIONALE OF THE STUDY:

A lot of studies explored that the enrolment rate in MOOCs is increasing day by day worldwide. The MOOCs are emerging educational opportunities to all of the students who wish to learn and want to cope up with the excellent educational resources from different part of the world. The learners from West Bengal also have equal opportunities to enrol in the different courses under MOOCs. In this study, researchers want to explore the present landscape of the participation and completion rate in MOOCs by learners from formal higher education institutions in the eastern part of India specifically in West Bengal. The research also aimed to identify the underlying causes of the present landscape. If higher education institutions in West Bengal want to utilize the potential advantage of MOOCs in students' learning then an in-depth study is essential to understand the variables, which affect the completion of the courses, and to clarify the drawbacks and potentials of the MOOCs in West Bengal. The study was conducted among the learners who enrolled in different programs in different Higher Education Institutions in West Bengal.

RESEARCH QUESTIONS:

To depict the real landscape of MOOC enrolment and completion among the learners of higher education institution and to fulfil the objectives of the study quantitatively and qualitatively ten research questions have been formulated which are as follows –

RQ1: How much is the overall enrolment rate in MOOCs among the learners of higher education institution?

RQ2: How much is the gender wise enrolment rate in MOOCs among the learners of higher education institution?

RQ3: How much is the programme wise enrolment rate in MOOCs among the learners of higher education institution?

RQ4: Which are the factors behind non-enrolment in MOOCs among the learners of higher education institution?

RQ5: Which are the factors behind enrolment in MOOCs among the learners of higher education institution?

RQ6: Which are the major MOOC platforms where the learners of higher education institution enrolled?

RQ7: How much is the overall completion rate in MOOCs among the enrolled learners?

RQ8: How much is the gender wise completion rate in MOOCs among the enrolled learners?

RQ9: How much is the programme wise completion rate in MOOCs among the enrolled learners?

RQ10: Which are the factors behind non-completion of MOOCs among the learners?

HYPOTHESIS:

In order to study on gender and programme wise learners' participation and completion in MOOCs based on research questions RQ2, RQ3, RQ8 and RQ9 the following hypotheses have been formulated:

H01: There is no significant difference in enrolment rate in MOOCs between male and female learners of higher education institution.

H02: There is no significant difference in enrolment rate in MOOCs among UG, PG and PhD learners of higher education institution.

H03: There is no significant difference in completion rate in MOOCs between male and female learners of higher education institution.

H04: There is no significant difference in completion rate in MOOCs among UG, PG and PhD learners of higher education institution.

METHODOLOGY OF THE STUDY: It is a survey based descriptive research.

- **Tools used:** A self-administered questionnaire was prepared by the researchers to obtain the data related to the MOOC enrolment and completion status of the learners of higher education institution. The questionnaire consisted four sections with applicable options. The first section was framed to collect primary information about the learners. The second section was aimed to collect data regarding MOOC enrolment rate, MOOC enrolment platforms and the factors of enrolment. The third section was aimed to collect data regarding the factors of non-enrolment. The last section was aimed to collect data regarding MOOC completion rate, and the factors of non- completion.

- **Area of the study:** The study has been conducted on the learners of higher education institution especially in different colleges and universities of West Bengal.

- **Variables of the study:**

  The following variables were considered for the study:

  - Independent variables –
    - Gender

        - Male
        - Female
    - Programme of the present study
        - Under Graduate (UG)
        - Post Graduate (PG)
        - Doctor of Philosophy (PhD)
- Dependent variables –
    - Enrolment rate
    - Completion rate
    - Factors of enrolment
    - Factors of non-enrolment
    - Factors of non-completion

- **Sample size:** Total 298 samples have been collected from the learners who were pursuing different general courses under UG, PG, and PhD programme in different colleges and universities of West Bengal using simple random sampling technique.

- **Collection of data:** The self-administered questionnaire in the Google Fform was sent to the learners of higher education institutions of West Bengal through social handles like, e-mail, Messenger, and WhatsApp during the end of 2023.

- **Analysis and interpretation:**

  In terms of enrolment and completion of MOOCs, the present research conducted a survey among the learners of higher education institutions of West Bengal. Among the total 298 students who were the part of this survey, 118 were male and 180 were female students. Among them 156 students were from undergraduate (UG) programme, 108 were from post graduate (PG) programme and 34 were from PhD programme. It has been found that total enrolment rate in MOOCs from the regular programmes of higher education institutions is only 12.75% (Fig. 1). In respect of gender wise participation, it has been observed that enrolment rate in MOOCs of male students (15.25%) was higher than female students (11.11%) (Fig. 2). For hypothesis testing '1' score has been given to those respondents who has enrolled in MOOCs and '0' who has not enrolled. Based on the enrolment scores it was found that there was no significant difference in the scores for male students ($M = 0.15$, $SD = 0.361$) and female students ($M = 0.11$, $SD = 0.315$); $t(296) = 1.047$, $p = 0.296$ at the 0.05 significance level (Table 1 and 2). These results suggested that the gender wise enrolments in MOOCs were more or less the same. From the perspectives of programme, the enrolment rate in MOOCs of UG students was very poor (5.13%), where it was 12.96% for PG students and 47.06% for PhD students (Fig. 3). A one way ANOVA was performed to evaluate the relationship between programmes of study (UG, PG, and PhD) and MOOCs enrolment scores. The means (0.05, 0.13, 0.47) and standard deviations (0.221, 0.337, 0.507) are

presented in Table 1 below. The ANOVA was significant at the .05 level, F (2, 295) = 25.634, p = .000 (Table 3) and the results suggested that there was a significant difference in the enrolments in MOOCs from UG, PG and PhD programmes. These results of the study also indicated that a major part of the students of regular programmes of higher education institutions remained out of the influence of MOOCs.

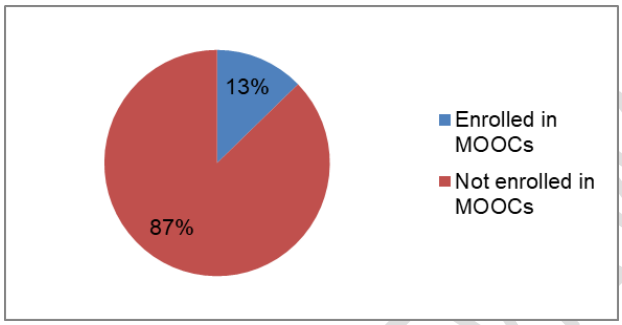

Fig. 1: Overall enrolment rate in MOOCs among the learners of higher education institution

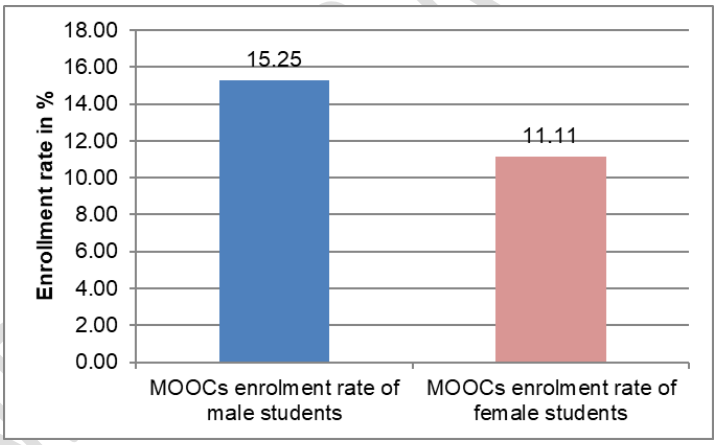

Fig. 2: Gender wise enrolment rate in MOOCs among the learners of higher education institution

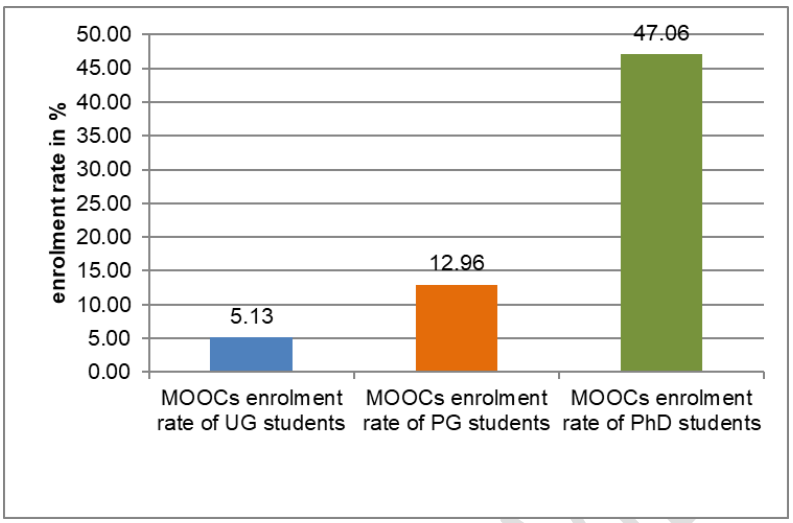

Fig. 3: Programme wise enrolment rate in MOOCs among the learners of higher education institution

Table 1: Group statistics for gender and programme wise MOOCs enrolment scores

		N	Mean	Std. Deviation	Std. Error Mean
Gender wise Enrolment Score	Male	118	.15	.361	.033
	Female	180	.11	.315	.023
Programme wise Enrolment Score	UG	156	.05	.221	.018
	PG	108	.13	.337	.032
	PhD	34	.47	.507	.087

Table 2: Independent Samples t Test results for gender wise MOOCs enrolment scores

		t-test for Equality of Means						
							95% Confidence Interval of the Difference	
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Gender wise Enrolment Score	Equal variances assumed	1.047	296	.296	.041	.040	-.036	.119

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Table 3: ANOVA results for programme wise MOOCs enrolment scores

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.909	2	2.454	25.634	.000
Within Groups	28.246	295	.096		
Total	33.154	297			

There were various factors behind the low enrolment rate in MOOCs among students who already enrolled in various regular programmes in higher education institutions. The most common factor is lack of knowledge about MOOCs. More than half of the students who were no enrolled in any MOOC stated that they had no knowledge about MOOCs. 40% of students who were not enrolled in MOOCs stated that they were not aware about the benefits of MOOCs. Affordability, as all MOOCs were not free of cost, was another constraint for some students (17.69%) towards enrolment in MOOCs. Some students (15.38%) also raised the issue of huge pressure of curriculum in their present regular courses. Poor internet connectivity was another problem for the students (10.00%), especially who lived in rural areas. Some students (9.23%) admired lack of ICT skills was another obstacle for them to enroll in any MOOC. Few students raised the different issues like they did not feel any need for any additional courses. Few of them raised question as there was no direct job opportunities after completion of any MOOC. Some institution had no provision to add credit earned by completion of any MOOC. Only few of them also stated that they felt anxiety to use technology or they had no internet connectivity or any devices form which they can access MOOCs such as personal computer, laptop, smart phone etc. (Fig. 4)

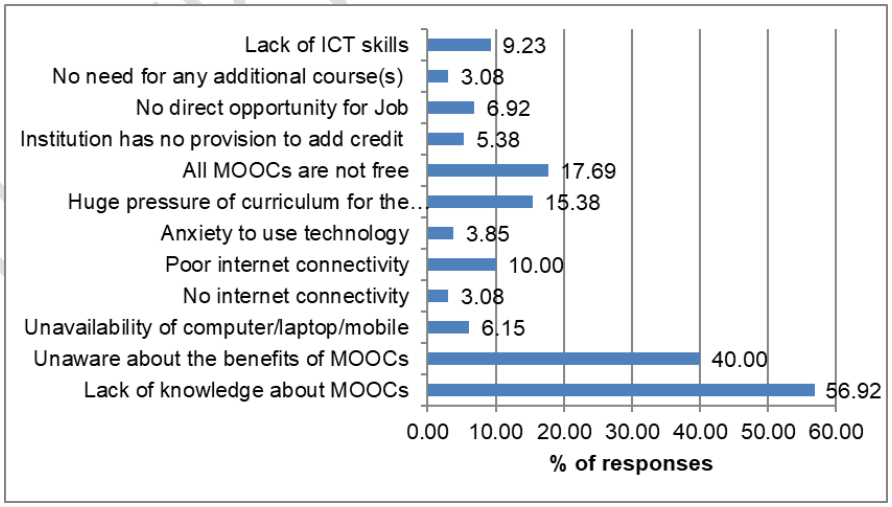

Fig. 4: Factors behind non-enrolment in MOOCs among the learners of higher education institution

Another interesting objective of the study was to explore the factors which played important role to motivate those students who enrolled in MOOCs. There were several factors behind the enrolment in MOOCs. Among those students who enrolled in MOOCs, major section (94.74%) stated that they enrolled MOOCs to learn new knowledge. This was the main goal for their enrolment in MOOCs. 57.89% enrolled students mentioned that they wanted to acquire new skills from MOOCs. Among them, 47.37% students stated that they enrolled in MOOCs to earn certificates. Interestingly, a section (26.32%) of the enrolled students admired that they were very interested to know about the instructional process in MOOCs. Only few students stated that they were instructed by their teacher to join the MOOCs and few compelled to enroll in MOOCs as they had no expert in a particular field at their institutions (Fig. 5).

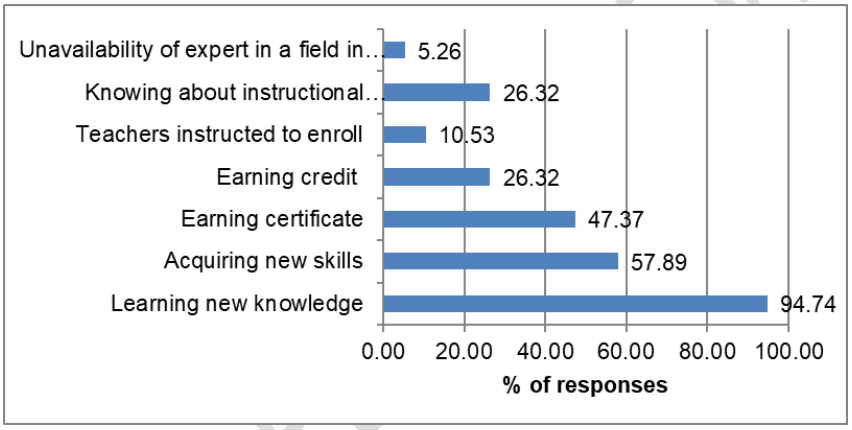

Fig. 5: Factors behind enrolment in MOOCs among the learners of higher education institution

It has been observed that most of the enrolled students (78.95%) enrolled in SWAYAM courses for MOOCs. Only few of them selected NPTEL, mooKIT, edX, Coursera, FutureLearn, Canvas Network, and NSOU LMS etc. for enrolling in MOOCs (Fig. 6).

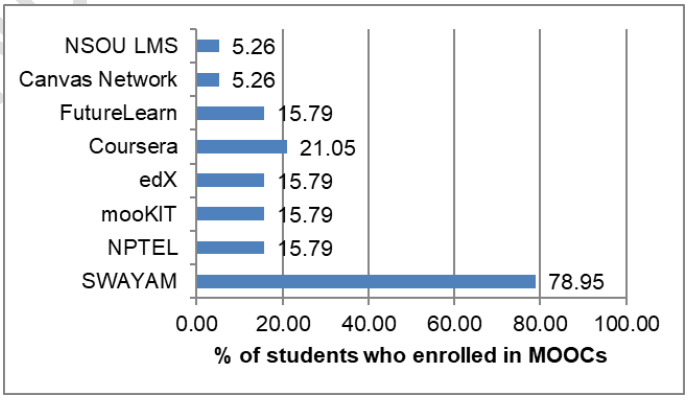

Fig. 6: Major MOOC platforms where the learners of higher education institution enrolled

The overall average MOOCs completion rate of the students of general courses from higher education institutions were only 8.55% (Fig. 7). A major section of enrolled students could not retain their interest till the end of the courses. This average completion rate was slightly higher for male students (11.46%) than the female (3.57%) students (Fig. 8). Based on the completion rate it was found that there was no significant difference between male students (M = 11.46, SD = 22.99) and female students (M = 3.57, SD = 13.36); t (36) = 1.169, *P* = 0.250 at the 0.05 significance level (Table 4 and 5). These results suggested that the gender wise completion rate in MOOCs were more or less the same. The MOOCs completion rate was maximum (14.06%) for the students under PhD programme, where it was 3.57% for PG students and 6.25% for UG students (Fig. 9). A one way ANOVA was performed to evaluate the relationship between programmes of study (UG, PG, and PhD) and MOOCs completion rate. The means (6.25, 3.57, and 14.06) and standard deviations (17.68, 13.36, and 25.36) are presented in Table 4 below. The ANOVA was not significant at the .05 level, F (2, 35) = 1.082, *P* = .350 (Table 6) and the results suggested that there was no significant difference in the MOOCs completion rate from UG, PG and PhD programmes.

Table 4: Group statistics for gender and programme wise MOOCs completion rate

		N	Mean	Std. Deviation	Std. Error Mean
Gender wise MOOCs completion rate	Male	24	11.458	22.9948	4.6938
	Female	14	3.571	13.3631	3.5714
Programme wise MOOCs completion rate	UG	8	6.250	17.6777	6.2500
	PG	14	3.571	13.3631	3.5714
	PhD	16	14.063	25.3620	6.3405

Table 5: Independent Samples t Test results for gender wise MOOCs completion rate

		t-test for Equality of Means						
		t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
							Lower	Upper
Gender wise MOOCs completion rate	Equal variances assumed	1.169	36	.250	7.8869	6.7453	-5.7931	21.5669

Table 6: ANOVA results for programme wise MOOCs completion rate

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	875.529	2	437.764	1.082	.350
Within Groups	14157.366	35	404.496		
Total	15032.895	37			

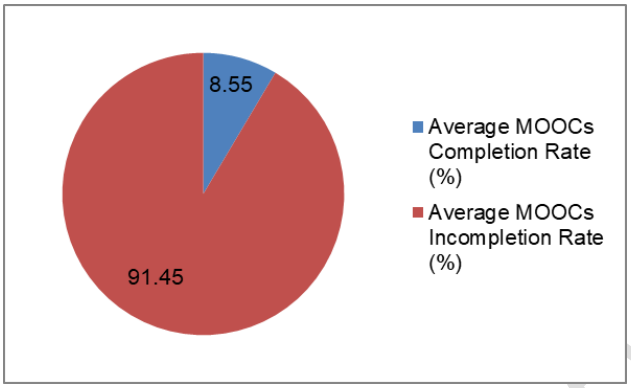

Fig. 7: Overall average completion rate in MOOCs among the enrolled learners

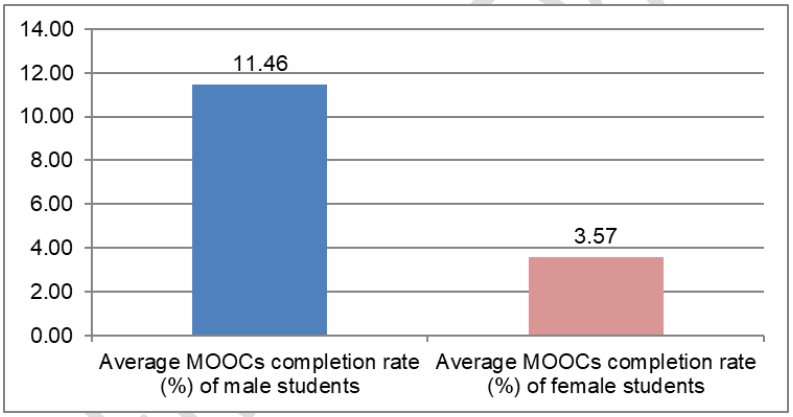

Fig. 8: Gender wise average completion rate in MOOCs among the enrolled learners

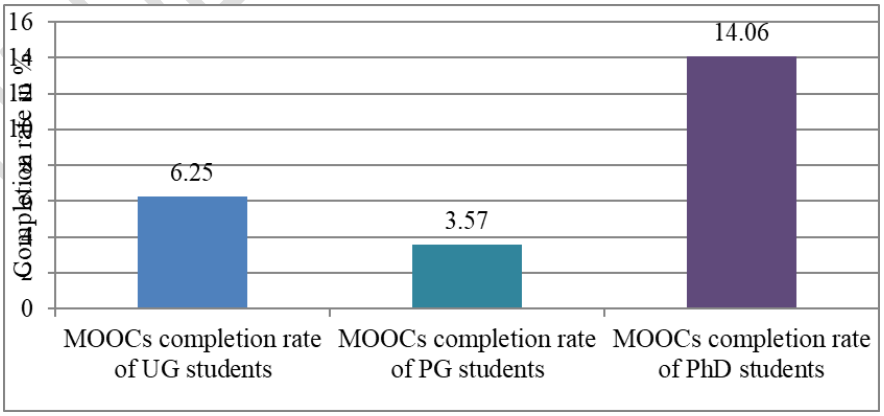

Fig. 9: Programme wise average completion rate in MOOCs among the enrolled learners

There were various causes behind the low completion rate. All the students who had not completed their courses in MOOC platform stated that they had not sufficient time to complete the courses. A section of students who did not complete MOOCs raised other issues as the factors of incompletion which are unaffordable costs, proctored examinations, non-cooperative facilitators, ineffective discussion forum, length of the courses etc. (Fig. 10).

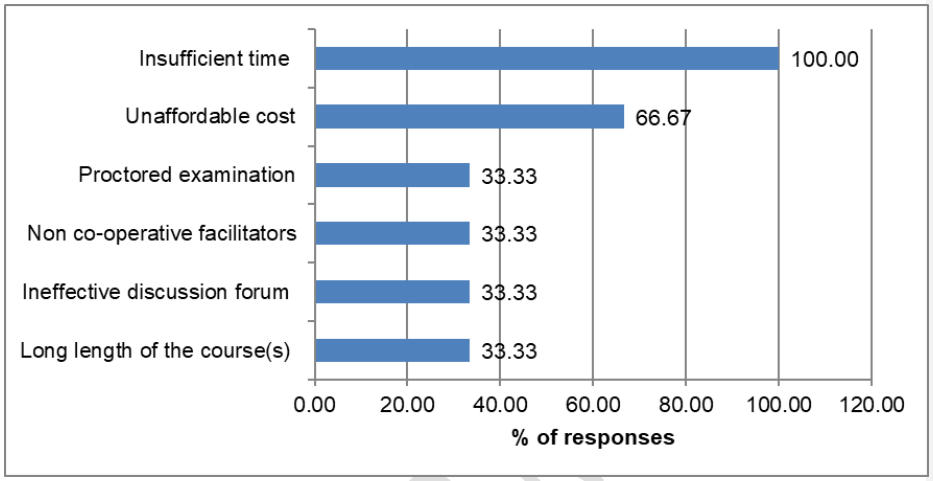

Fig. 10: Factors behind non-completion of MOOCs among the enrolled learners

MAJOR FINDINGS:

- Total enrolment rate in MOOCs from the regular programmes of higher education institutions is only 12.75%
- Enrolment rate in MOOCs of male students (15.25%) was higher than female students (11.11%)
- Gender wise enrolments in MOOCs were more or less the same
- Enrolment rate in MOOCs of UG students was very poor (5.13%), where it was 12.96% for PG students and 47.06% for PhD students
- There was a significant difference in the enrolments in MOOCs from UG, PG and PhD programmes
- The most common factor is lack of knowledge about MOOCs.
- 40% of students who were not enrolled in MOOCs stated that they were not aware about the benefits of MOOCs.
- Other factors – Affordability, huge pressure of curriculum, Poor internet connectivity, lack of ICT skills etc.
- Factors which played important role to motivate those students who enrolled in MOOCs - learn new knowledge, acquire new skills, earn certificates etc.
- Most of the enrolled students (78.95%) enrolled in SWAYAM courses for MOOCs.

- The overall average MOOCs completion rate of the students of general courses from higher education institutions were only 8.55%
- Average completion rate was slightly higher for male students (11.46%) than the female (3.57%) students
- Gender wise completion rate in MOOCs were more or less the same
- The MOOCs completion rate was maximum (14.06%) for the students under PhD programme, where it was 3.57% for PG students and 6.25% for UG students
- There was no significant difference in the MOOCs completion rate from UG, PG and PhD programmes
- Causes behind the low completion rate – lack of sufficient time to complete the courses, unaffordable costs, proctored examinations, non-cooperative facilitators, ineffective discussion forum, length of the courses etc.

Discussion:

Bonk and Khoo (2014) identified three main factors that affect online learner attrition i.e., individual factors, course-related factors and technological factors. TEC-VARIETY framework emphasized on ten motivational principles for online learners ie., tone or climate, encouragement, curiosity, variety, autonomy, relevance, interactivity, engagement, tension and yielding products [19]. The interplay of three factors i.e., teaching, social, and cognitive presences as experienced by students in the learning community - led to profound and meaningful online learning [20]. In an online course, students report high levels of perceived cognitive present and self-regulation. On the other hand, a comprehensive understanding of co-regulation in addition to self-regulation promises better outcomes in creating an online collaborative community of inquiry, since students' co-regulation provides control over learning, time, and process, and is becoming increasingly important, especially with online collaborative learning. In addition to their own reflections, students can become aware of and involved in the metacognitive thoughts and activities of others in the online courses [21]. Cognitive presence has a mediating role of the relationship between teaching presence, self-regulation, and learning engagement as well as the direct effects on learning engagement [22]. While teaching presence and social presence also have a positive correlation, there is a strong correlation between cognitive presence and deep learning approaches [23]. Higher degrees of cognitive presence arise as a result of the scaffolding aspects incorporated into the learning modules, particularly for students who possess prior knowledge [24]. The real learning outcomes of students are positively and directly impacted by learner empowerment in online learning environment [25]. We should make efforts to enhance students' cognitive presence for promoting learning engagement, teach self-regulation strategies and provide opportunities to practice self-regulation [22].

Every system has some challenges whether it is traditional Face-to-Face classroom teaching or online teaching or blended. With limited human resources and physical infrastructure, it may not be possible to achieve the overarching goals of Higher Education within a short span of time frame but there is a silver lining to reach the unreached. In this mission of drawing out the optimum

opportunities towards multidisciplinary and holistic education, technology is the game changer. Technology integration in education is the best way to address the issues like accessibility, inclusivity, and lifelong learning. But whenever we talk about accessibility and inclusivity, we face the challenges of (ai) digital divide, (bii) poor internet connectivity, (ciii) poor supply of electricity, (div) lack of training for teachers, and (eiv) language of the e-content and so on. The present study with the its delimitation has tried to interpret the landscape of higher education and unleashing MOOCs as a vehicle of promoting higher education in India.

REFERENCES:

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1. Kaplan A. M., Haenlein, M. Higher education and the digital revolution: About MOOCs, SPOCs, social media, and the Cookie Monster, Business Horizons. 2016; 59(4):441-450.
2. Baturay, M. H., An overview of the world of MOOCs, Procedia - Social and Behavioral Sciences. 2015; 174, 427 – 433.
3. Chauhan, J., Goel, A. An Overview of MOOC in India. International Journal of Computer Trends and Technology. 2017; 49(2):111-120.
4. Hone. K. S., El Said, G .R., Exploring the factors affecting MOOC retention: A survey study, Computers & Education. 2016; 98, 157-168.
5. Conole, G. A new classification schema for MOOCs, The International Journal for Innovation and Quality in Learning. 2014; 3, 65-77
6. Brouns, F., Mota, J., Morgado, L., Jansen, D., Fano, S., & Silva, A., et al. (2014) A networked learning framework for effective MOOC design: the ECO project approach. In A. M. Teixeira & A. Szücs (Eds.), 8th EDEN Research Workshop. Challenges for Research into Open & Distance Learning: Doing Things Better: Doing Better Things. Oxford, United Kingdom Budapest, Hungary: EDEN.
7. Tracey, R. (2013). *The definition of a MOOC*. eLearning Industry. https://elearningindustry.com/the-definition-of-a-mooc. Accessed 25 November 2023.
8. Aparicio, M., Oliveira, T., Bacao, F., & Painho, M. Gamification: A key determinant of massive open online course (MOOC) success. Information and Management. 2019; 56(1), 39–54.
9. Aldahmani S., Al-shami S.A., Adil H., Sidek S. A review paper on MOOCs development stages, types, opportunities & challenges. Systematic Reviews in Pharmacy. 2020;11(12):172-179.
10. Cinquin, P.-A., Guitton, P., & Sauzeon, H. Online e-learning and cognitive disabilities : A systematic review To cite this version : HAL Id : hal-01954983 Online elearning and Cognitive disabilities : a. Computers and Education. 2019; 1320, 152-167.

11. Yousef, A. M. F., Chatti, M. A., Schroeder, U., Wosnitza, M., & Jakobs, H. MOOCs a review of the state-ofthe- art. Csedu. 2014; 6(3), 9–21.
12. Badali, M., Hatami, J., Banihashem, S.K. et al. The role of motivation in MOOCs' retention rates: a systematic literature review. RPTEL . 2022; 17, 5.
13. Hadi. S. M., Rawson. R. Driving Learner Engagement and Completion within MOOCs: A Case for Structured Learning Support. Proceedings of the European MOOC Stakeholder Summit; 2016.
14. Khalil, H. & Ebner, M. (2014). MOOCs Completion Rates and Possible Methods to Improve Retention - A Literature Review. In J. Viteli & M. Leikomaa (Eds.), *Proceedings of EdMedia 2014--World Conference on Educational Media and Technology*.2014; 1305-1313. Accessed August 9, 2023.
15. Parr, C. New study of low MOOC completion rates | Inside Higher Ed. Inside Higher Ed. 2013.
16. Ho, A.D., Reich, J., Nesterko, S.O., et al. HarvardX and MITx: The First Year of Open Online Courses, Fall 2012- Summer 2013. Social Science Research Network, Rochester, NY, 2014.
17. Jiang, S., Schenke, K., Eccles, J. S., Xu, D., & Warschauer, M. Females' enrollment and completion in science, technology, engineering, and mathematics Massive Open Online Courses. 2016.
18. Meinel, C., Willems, C., Renz, J., & Staubitz, T. Reflections on enrollment numbers and success rates at the openhpi mooc platform. *Proceedings of the European MOOC Stakeholder Summit*. 2014; 101-106.
19. Bonk, C. J., & Khoo, E. *Adding some TEC-VARIETY: 100+ activities for motivating and retaining learners online*. 2014; Accessed November 16, 2023. Available: https://www.learntechlib.org/p/147416/ebook_147416.pdf
20. Hu, Y., Huang, J., & Kong, F. College students' learning perceptions and outcomes in different classroom environments: A community of inquiry perspective. *Frontiers in Psychology*, 2022; *13*.
21. Sadaf, A., Kim, S. Y., & Olesova, L. Relationship between metacognition and online community of inquiry in an Online Case-Based course. *Online Learning*, 2022; *26*(4).
22. Doo, M. Y., Bonk, C. J., & Heo, H. Examinations of the relationships between self-efficacy, self-regulation, teaching, cognitive presences, and learning engagement during COVID-19. *Educational Technology Research and Development*. 2023; *71*(2), 481–504.
23. Maria-Eleni, B. Investigating the communities of inquiry in blended learning environments. *International Journal of Education, Learning and Development*, 2023; *11*(7), 1–17. https://doi.org/10.37745/ijeld.2013/vol11n7117

24. Mamun, M. a. A., & Lawrie, G. (2023). Cognitive presence in learner–content interaction process: The role of scaffolding in online self-regulated learning environments. *Journal of Computers in Education*, 2023.
25. Sun, Z., & Yang, Y. (2023). The mediating role of learner empowerment in the relationship between the community of inquiry and online learning outcomes. *The Internet and Higher Education*. 2023; *58*.