Transnational Marketing Journal
October 2022
Volume: 10, No: 3, pp. 533 –546
ISSN: 2041-4684 (Print) | ISSN 2041-4692 (Online)
TransnationalMarket.com

TRANSNATIONAL PRESS® LONDON

Received: 26 May 2022 Accepted: 11 June 2022
DOI: https://doi.org/10.33182/tmj.v10i3.2351

SDG 4 and Program inclusive credit-based MOOCs in Higher Educational Institutions of India (HEIs); Students' perspective

Amardeep Singh[1] and Karina Bhatia Kakkar[2]

Abstract

The united nations in its agenda 2030 about sustainable development, has listed quality education as a Special Development Goal (SDG) 4. The National Education Policy (NEP) 2020, aims at achieving a 50% Gross Enrolment Ratio by 2030 and for this India requires more than 3 million additional teachers. To ensure equity and access to quality education, the University Grants Commission (Credit Framework for Online Learning Courses through Study Webs of Active Learning for Young Aspiring Minds) Regulations, 2021 have allowed Higher Educational Institutions (HEIs) to offer 20% to 40% of the courses of the program through credit-based massive open online courses (MOOCs). Though students' perspective of MOOCs and other e-learning models has been in focus since the last decade, there is still a paucity of studies on program inclusive credit-based massive open online courses. This research is a novel attempt to investigate the student's perspective on credit-based program inclusive MOOCs. Based on the existing theory, a proposed conceptual model has been tested by applying model fit indices. The measurement model has been tested by applying confirmatory factor analysis (CFA) and a structural model by applying path analysis and structural equation modeling (SEM). Specifically, the impact of course content, instructional language, and learning outcomes has been analysed on student preference for credit-based MOOCs. Additionally, the impact of assigning credit to MOOCs on self-efficacy has also been examined.

Keywords: *MOOCs; Blended; E-learning; Credit; Program; Online*

1. Introduction

Massive open online courses (MOOCs) are best suited to ensure equity and access to quality education and can cater to the needs of developing nations in a very cost-effective environment. The focus of Special Development Goal (SDG) 4 is to develop an ecosystem for egalitarian, high-quality, and lifelong learning and is to serve as a foundation for achieving all of the other 16 Goals (Ferguson & Roofe, 2020). In the context of India, the Gross Enrolment Ratio (GER) in higher education for students aged 18 to 23 years stands at 27.1 percent(AISHE Final Report 2019-20 - English, 2020.). When it comes to providing equal access to quality education, India has confronted several obstacles. To achieve its aim of sustainable education, India must investigate alternative and current educational options as well to identify the best practices that can be used to empower the country's learners (Virani et al., 2020). India started its MOOC journey with the launch of NPTEL (I.I.T. Madras) in 2003, followed by mooKIT (I.I.T. Kanpur) in 2012, and IITBX (I.I.T. Bombay) in 2014. Swayam Portal was added in 2017 and has grown tremendously in popularity throughout the years. The Ministry of Human Resource Development (MHRD) of India's government has

[1] Amardeep Singh, (Corresponding Author), G.D Goenka University, Sohna, Gurugram, Haryana., India. ORCID ID: 0000-0001-8790-8641 E-mail: amarchhatwal@gmail.com; 200010602018.amardeep@gdgu.org
[2] Dr. Karina Bhatia Kakkar, G.D Goenka University, Sohna, Gurugram, Haryana, India. ORCID ID: 0000-0002-5208-0132 E-mail: kareenabhatia@gmail.com; kareena.kakkar@gdgoenka.ac.in

proposed many policies and programs to popularise online education through MOOCs, which will aid in disseminating need-based and long-term education to the people (Bordoloi et al., 2020).

Ferguson and Roofe (2020) highlight that the higher education industry is diverse, and possibilities to teach information, skills, and values linked with SDG 4 through multiracial, multicultural, and multinational lenses exist within this diversity. India, itself is a diverse and multicultural society and it has tremendous scope to impart quality education to its masses through technology-enabled platforms. Indian students in large volumes are seen to be enrolling in MOOCs on both private and Government-sponsored platforms.

The recent notifications by the University Grants Commission (UGC) one of the apex bodies in higher education, has allowed credit transfer for the MOOC courses pursued and completed by students from the Swayam portal. The idea is that the facility of credit transfer shall make higher education flexible and will provide global mobility to the students and they will be able to pursue subjects/courses of their choice. (Bordoloi *et al.*, 2020). The MOOCs in the Indian higher education system are set to be program inclusive. Though the enrolment of students in these courses is encouraging, the gap between enrolment and successful certification is huge. As of May 5, 2020, of the 18,249,679 students enrolled, only 1,047,828 have been certified (Swayam Central, 2022.). This sums up to 5.74% of certifications out of the total enrolment. Most of the courses offered by Swayam are credit-based. Students can complete 20 percent of the credit requirement of a program through these massive online courses offered almost free of cost and after completion can seek a credit transfer to their parent institute.

India's new National Education Policy (NEP) 2020 lays out a comprehensive framework right from primary education to higher education, including vocational and technical education, and promotes internet-based e-learning. The 5 founding pillars of NEP 2020 are, access with equity, affordability, accountability, and quality and these have been taken into consideration to design India's new education system in perfect agreement with the UN's 2030 agenda for sustainable development (K. Kumar et al., 2020). MOOCs are considered disruptive and can play an important role in achieving sustainable educational goals. India is one of the top 5 countries in the world where 3.4 million people have enrolled in MOOC courses, 93 percent of these students are between the ages of 18 and 39 (Pillai & Sivathanu, 2020). MOOCs are revolutionising the way students learn and are assisting in reskilling and upskilling Indian masses, and they are riding the next wave of learning and education. Despite exponential growth in enrolment in SWAYAM MOOCs, less than 6 percent of certifications are a cause of worry and warrant proper attention. An attempt has been made in this paper to analyze the learner's perception of credit-based MOOCs to understand how course content, instructional language, and learning outcomes, impact student preference for credit-based MOOCs. Further, this study also investigates how assigning credit impacts the self-efficacy of students toward these courses.

1.1 SDG 4 and the relevance of MOOCs in the Indian context.

The 2030 agenda of Sustainable Development Goals (SDGs) emphasises quality education that is for all and provides lifelong learning opportunities (Hajdukiewicz and Pera, 2020). Countries worldwide are committed to the achievement of 17 SGDs. The most important of these stands out to be SDG4 which will serve as a premise for achieving the rest of the goals.

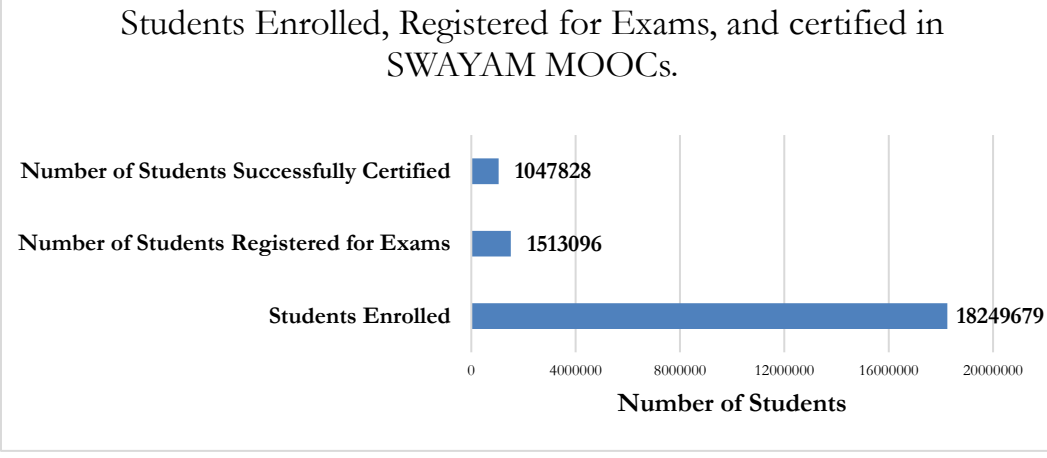
Education for all is on the prime agenda of the nations including India which plans to achieve 50% GER by 2030. The previous goal was to achieve 30% GER in higher education in India by 2020. Despite its best efforts, India has not been able to reach 30% GER and at present, it is 26.3%, Government of India (GOI) has initiated efforts to improve the same by embedding 21st-century digital skills for knowledge dissemination among the citizens of a nation (Bordoloi et al., 2021). In its attempt to improve the flow of knowledge among its masses, GOI is looking toward MOOCs as a potential instrument. UGC through its regulations in 2016 decided on 20% of program delivery which was further increased to 40% in 2020 to be released in the form of MOOCs (Bordoloi *et al.*, 2021). In 2018–19, the GER in higher education was estimated to be approximately 26.3 percent (AISHE Final Report 2019-20 - English, 2020.). India's higher education system has developed enormously. There are more than 700 lakh students enrolled and such expansion could only be achieved with the extensive use of ICT tools. To put it in perspective, if India had constructed this additional capacity only through offline institutions, it would have taken the country 20 years by building 6 universities and 270 colleges per month, almost unthinkable given India's limited resources (Pant et al., 2021). As per the 2011 Census Report, more than 2/3rd of the population of the country resides in rural areas with limited access to quality education. MOOCs therefore can play an important role in achieving SDG4 in India. In the Indian context, with the most population living in rural areas MOOCs can play an important role in imparting quality learning (Agnihotri & Pandit, 2021). As MOOCs provide an opportunity for both quality and lifelong learning, they are a perfect EdTech tool to give impetus toward the achievement of SDG4. MOOCs are thought to be a medium that supports lifelong learning, one of the United Nations' Sustainable Development Goals (SDG4) for member nations to accomplish by 2030 (Lambert, 2020).

1.2. Literature review

The literature review reveals geographical skewness in previous studies on student perception of MOOCs and various other aspects. Most of the research on MOOCs is primarily specific to developed nations and it has been found that the majority of studies have been conducted in the Western world and other countries; there are only a few studies accessible in the Indian context (Singh & Chauhan, 2017 Trehan et al., 2017) The Major empirical research on MOOCs has focused on industrially advanced countries in North America and Europe, with little literature focusing on MOOC adoption in developing countries in Asia and Africa (Liyanagunawardena et al., 2013; Veletsianos & Shepherdson, 2016; Ma & Lee, 2020). This skewness has also been confirmed in the various systematic literature reviews undertaken by the researchers. Zhu et al. (2020), in their comprehensive review of MOOC research between 2009 to 2019 reported that the most of the empirical MOOC research based on the first authors' affiliations of 541 MOOC studies belonged to The United States (n = 162), China (n = 64), the United Kingdom (n = 55), Spain (n = 44), and Australia (n = 26). Moreover, regarding countries where these studies were conducted not even one was reported to be from India. As western and eastern nations have diverse learning systems and approaches, an Asian and particularly Indian perspective will add to the variety of perspectives on the MOOC phenomena. Moreover, with the rising importance of MOOCs in the formal instructional framework of higher educational institutions, it has become pertinent to assess the students' perception of credit-based MOOCs in India. Since 2016, India has reacted positively to the MOOC revolution, not only has India partnered with worldwide MOOC platforms such as

Coursera, edX, and FutureLearn, but it has also built its platforms such as SWAYAM, NPTEL, and IIMBx (Pant et al., 2021). Despite a proactive approach toward the adoption of MOOCs, the matter of concern remains the low retention rate among students. The main issue is that MOOC platforms have generally failed to improve students' poor retention rates over the years (Pant et al., 2021) The scenario remains more or less the same for SWAYAM, India's indigenous MOOC Platform as well. As of May 5, 2022, there are over 18 million students enrolled in credit-based SWAYAM MOOCs, of whom only 8.29 percent, or little more than 1.5 million, registered for assessments, and 5.74 percent, or slightly more than a million, were successfully certified.

Figure 1. Source: Author (Data sourced from Swayam Central)



The literature review unfolds a few predictive studies that indicate that assigning credit may lead to better retention rates and learning opportunities (Chamberlin & Parish, 2022; Baylor University Teaching, Learning, and Technology Committee, 2013). A study based on the perception of Turkish students confirms the positive impact of credit on retention rates and learning opportunities. The lack of credit lower students' inner and extrinsic goal orientation, as well as their perception of course value (Kursun, 2016). Barring a few exceptions, mostly the studies conducted on different perspectives of MOOCs do not differentiate between credit and non-credit-based MOOCs and this study is a novel attempt in this direction, specifically in the Indian context. This study examines the influence of course content, instructional language, and learning outcome on a student's preference for credit-based MOOCs. It also examines the impact of assigning credit to the course on the self-efficacy of students, which is a prerequisite for completing the MOOC course. The students with high self-efficacy at the start of the MOOC course are more inclined toward its completion (Jung & Lee, 2018). Therefore, the current study aims to probe possible answers to the following research questions:

RQ1: What are the impact of course content, instructional language, and learning outcome on learners' preference for credit-based MOOCs?

RQ2: What is the impact of assigning credit to the MOOCs on the self-efficacy of a student.

2. Conceptual model development

2.1 Course content and preference for credit-based MOOCs

Course content plays an important role in learners' engagement and has a positive impact on student preference and engagement for a given course. Therefore, the design and presentation of course need serious deliberation during its planning and execution. There is a suggested link between student involvement, preference, and the presentation and design of learning materials (Dreisiebner, 2019). Meaningful and interesting course content improves user satisfaction and leads to positive student perception of MOOCs therefore, MOOC platforms must be designed to adopt interoperability and meaningful content (Mcauley et al., 2010 ; Zheng et al., 2018; Kumar & Kumar, 2020). Thus, it is hypothesized:

H1: Course content positively influences student preferences toward credit-based MOOCs.

2.2 English as an instructional language and preference for credit-based MOOCs

It is necessary to investigate the impact of language proficiency on MOOC uptake because communication is essential in all forms of learning, whether online or offline (García-Peñalvo et al., 2018). Around 80% of MOOCs on various platforms like edX, Coursera, and even SWAYAM are delivered in English. Though over the years MOOCs are being designed in the major languages of the world still English remains the major instructional language. India is the world's second-largest non-native, English-speaking country, students enrolled in higher educational institutions are well-conversant in communication skills and language abilities, and they are at ease with MOOC content delivery in English (Meet et al., 2022). Language competency also impacts students' engagement, persistence, and continuity in learning a MOOC (Abeer & Miri, 2014; Mamgain et al., 2014; Alcorn et al., 2015). Therefore, the proposed hypothesis is

H2: Instructional language ability positively influences student preference toward credit-based MOOCs.

2.3 Learning outcomes and preference for credit-based MOOCs

Learning outcomes are what is formally assessed and accredited to the student, and they provide a foundation for a feasible approach for designing courses in higher education that changes the emphasis from input and procedure to student learning (Allan, 1996). Most empirical data have so far focused on the relationship between student satisfaction and perceived learning outcome, with a strong positive relationship found (Hew & Cheung, 2014; Ain et al., 2016). Therefore, a proposed hypothesis is

H3: Learning outcomes influence student preference toward credit-based MOOCs positively.

2.4 Self-Efficacy

Self-efficacy encompasses the people's judgments of their capabilities and skills to arrange and develop a plan of action required to achieve certain performances (Chemers et al., 2001). Students with higher self-efficacy are more likely to set more difficult long-term objectives for themselves (Zimmerman, 1990). Self-efficacy has been linked favourably to student satisfaction from online courses Students who complete MOOC courses have had high self-efficacy (Abeer & Miri, 2014; Wang & Baker, 2015; Jung & Lee, 2018). Students revealed that

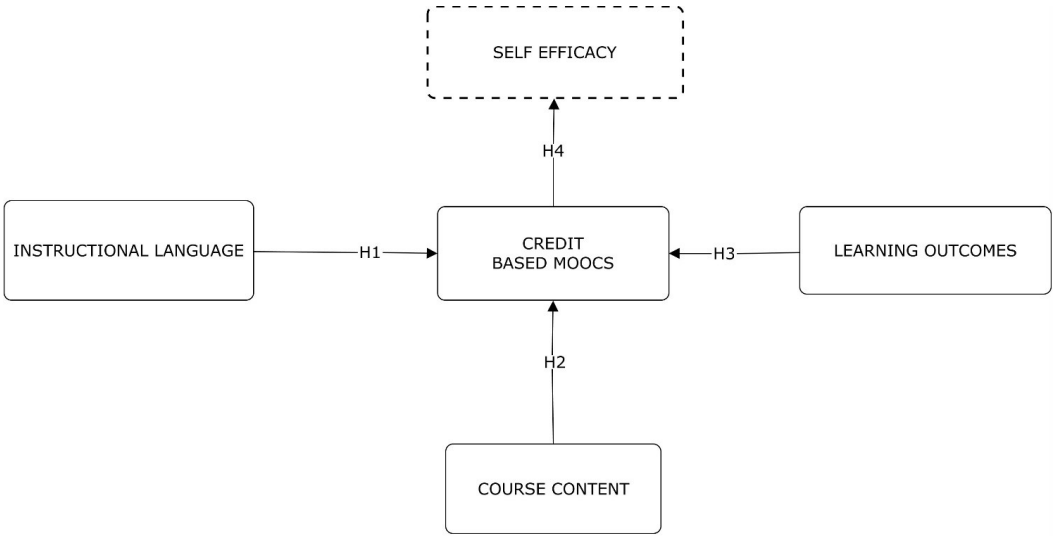
taking a credited MOOC increases their commitment to finishing the course and improved their grasp of the subject (Chamberlin & Parish, 2011). Therefore, a proposed hypothesis is;

H4: Assigning credit to a MOOC course positively influences the self-efficacy of students.

3. Research methodology

This study is based upon a quantitative approach. To empirically evaluate the proposed model, data are obtained from respondents through an online survey, and the research model is then tested based on the data.

Figure 2. Conceptual Research Model



3.1. Survey Instrument

The survey covered items related to all 5 constructs: course content, instructional language, learning outcome, credit assigned MOOCs, and Self -Efficacy. As no dedicated questionnaire for the above-listed constructs was available, a semi-structured questionnaire was developed, based on similar previous studies (Allan, 1996; Peltier et al., 2003; Rahmadani, 2016; Tsai et al., 2020). Validated items for each theoretical construct were selected and operationalised. Since the constructs' results were revealed to be unmet by the current instruments, a few questions were added to the survey instrument. Two field specialists were contacted, and their input has been incorporated into the validation process. According to these ideas, the questions are altered. The questionnaire is divided into 2 sections: one for recording demographic information about respondents, and another for measuring the construct of the proposed theoretical model with questions. The responses are recorded using Likert's five-point agreement scale (5: Strongly Agree to 1: Strongly Disagree) for the observed variables of each construct. In the initial segment, there were 4 demographic questions and 20 questions for measuring the 5 components (Appendix). The recommended sample size for confirmatory factor analysis (CFA) is 10:1 respondents to a variable ratio (Hair et al., 2014) There are 24 statements in our study; using the 10:1 ratio, the current sample size (of 243) is justified (Rastogi et al., 2019).

3.2 Sample and Data Collection

The respondents included in this study are undergraduate and postgraduate students, enrolled in higher educational institutions in Delhi-NCR and have pursued MOOC courses in the past. The data were collected between March 2022 and April 2022. The profile of the respondents is evident in Table 1. The data were collected through google form. The total responses received were 267, but only 243 were found suitable to be included in the study.

4. Data analysis

The data has been analysed by applying a two-step process. To begin, CFA is performed using the IBM AMOS-28 software. The measurement model is created using 5 constructs, followed by testing of model fitness and assessment of construct validity, using the results. SEM is used in the second stage to perform path analysis on the given model and has also been used to examine the impact of correlations between theoretical constructs.

4.1. Measurement Model

The CFA output is used to verify the model's fit to see how well it represents the data, represented diagrammatically in Figure 3.

Table 1. Demographic profile of respondents

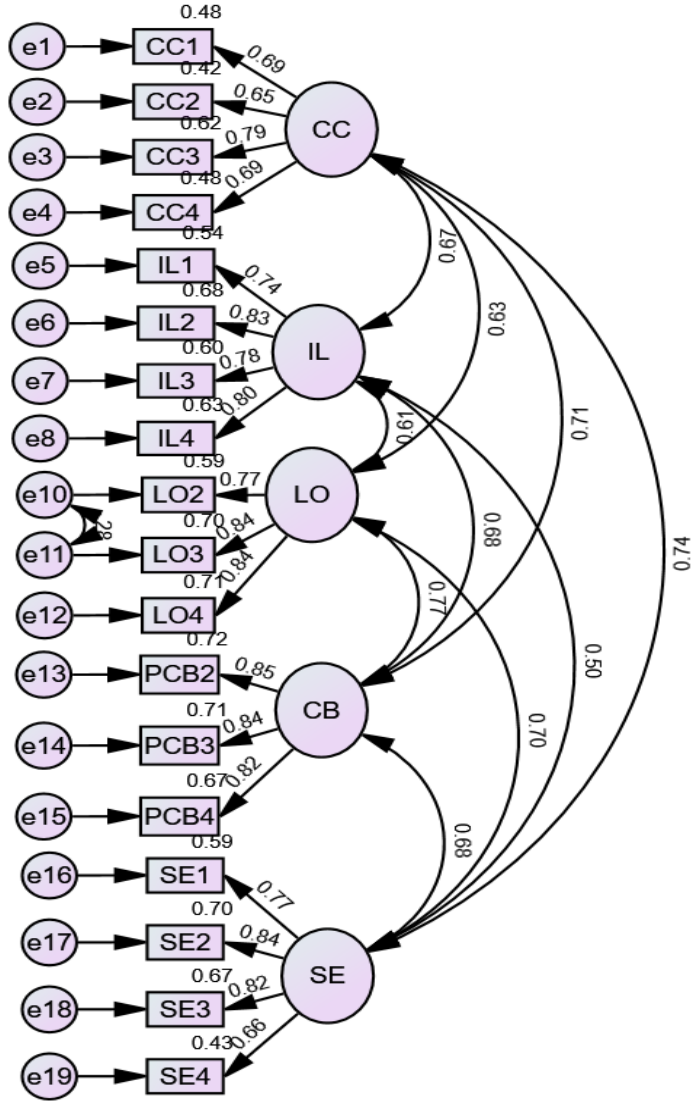
Attribute	Type	Frequency	Percentage
Gender	Female	119	48.97%
	Male	124	51.03%
Age	Between 17-21 Years	197	81.07%
	Between 22-25 years	46	18.93%
Program enrolled	Undergraduate	189	77.77 %
	Post Graduate	54	33.33 %
Location	Delhi NCR	243	100%
	Other	0	0

These model fit indices available from the output are compared with commonly used data. This comparison is shown in Table 3. The table indicates that the model fitness values are within acceptable limits and that the model is a good fit to represent the data.

Table 2. Model Fit (MF) indices

Model Fitness Indices	Recommended Value	Estimated Value	Remark
Root mean square error of approximation (RMSEA)	<0.8	0.79	Good Fit
Chi square/degree of freedom (CMIN/df)	<3.0	2.52	Good Fit
Comparative Fit Index (CFI)	>0.9	0.922	Good Fit
Tucker Lewis Index (TLI)	>0.9	0.904	Good Fit

Figure 3. Confirmatory Factor Analysis



4.2 Construct reliability and validity

To determine convergent validity below and reliability factor loadings, Construct Reliability (CR), Average Variance Extracted (AVE) and Cronbach Alpha have been determined and are presented in Table 4.

The factor loadings for almost all the constructs are above 0.7 and a few are above 0.65. The model fulfills the conditions of convergent validity if AVE for each construct exceeds 0.50, CR is above 0.7 and CR outperforms AVE (Fornell and Larcker, 1981). In the proposed

model, if AVE for all constructs is greater than 0.50, CR is greater than 0.70 and CR is greater than AVE at all levels, the convergent validity is thus established (Hair *et al.*, 2014). The reliability analysis for the scale used in this study was carried out using SPSS 26.0 and the result is presented above in Table 4. The values derived for each construct are greater than 0.70. This confirms the reliability of the measurement instrument (Fornell and Larcker, 1981).

Discriminant validity is determined based on AVE, Maximum Shared Variance (MSV), and the square root of AVE, measured and presented in Table 4.

Table 4. Convergent Validity and Reliability

Construct	Item Codes	Item Loadings	CR	AVE	CA
Course Content	CC1	.699	.805	**0.510**	0.769
	CC2	.657			
	CC3	.795			
	CC4	.698			
Instructional Language	IL1	.743	.866	**0.626**	0.861
	IL2	.836			
	IL3	.784			
	IL4	.801			
Learning Outcome	LO2	.774	.857	**0.675**	0.836
	LO3	.847			
	LO4	.843			
Preference for credit-based MOOCs	PCB2	.856	.875	**0.720**	0.876
	PCB3	.841			
	PCB4	.825			
Self-Efficacy	SE1	.779	.838	**0.608**	0.828
	SE2	.842			
	SE3	.820			
	SE4	.667			

The assessment of discriminant validity is based upon AVE and MSV, it is established if, AVE is greater than MSV and the square root of AVE exceeds the correlation coefficient of any individual constructs with other constructs (Hair *et al.*, 2014). Therefore, the results established discriminant validity (Table 5). There are no validity issues with the model and it is fit for applying SEM and path analysis.

Table 5. Discriminant Validity

Latent Variables	AVE	MSV	**MaxR (H)**	CC	IL	LO	CBM	SE
Course Content (CC)	.510	.465	.814	**.714**				
Instructional Language (IL)	.626	0.466	.869	.620	**.791**			
Learning Outcome (LO)	.675	.593	.861	.547	.608	**.821**		
Credit -Based-MOOcs (CBM)	.720	.593	.876	.624	.683	.770	**.848**	
Self-Efficacy (SE)	.608	.486	.869	.682	.505	.697	.684	**.779**

4.3. Structural equation modeling

For Path analysis and model hypothesis testing, the IBM AMOS-28 Graphics software has been used. The study applies SEM analysis for estimations, and verification of the theoretical conceptual model based upon statistical data and relates it to the final results (Shah & Goldstein, 2006). The model is shown in Figure 4 and all 4 hypotheses are tested together. Arrows indicate regression weights and Table 6 summarizes the hypotheses.

Figure 4. Path Diagram

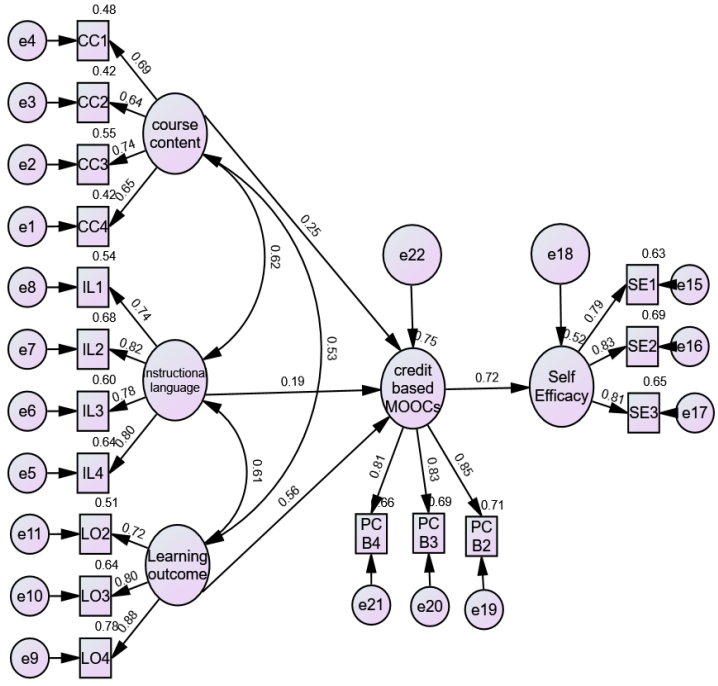


Table 5. Testing of Hypothesizes

Hypothesis	R^2 Path Coefficient	P Value	Remark
H1: Course Content ⟶ Preference for credit-based MOOCs	0.246	.001	Accepted
H2: Instructional Language ⟶ Preference for credit-based MOOCs	0.193	.011	Rejected
H3: Learning Outcome ⟶ Preference for credit-based MOOCs	.557.	***	Accepted
H4: Credit Based MOOCs ⟶ Preference for credit-based MOOCs	0.721	***	Accepted

Analysis of Figure 4 and Table 5 reveals that course content significantly affects preference for credit-based MOOCs, it matters what content is being taught in a credit-based MOOC. English as an instructional language has no significant effect on the preference of students for credit-based MOOCs. Learning outcome has a significant impact on student preference for credit-based MOOCs. Students are concerned about the value-added after completion of the

course. Lastly assigning credit to a MOOC has a considerable positive impact on the self-efficacy of students and thus likeliness of completing of the course increases.

5. Research Implication

The present study has both theoretical and practical implications. A theoretical model is proposed for the testing impact of course content, instructional language, and learning outcome on credit-based MOOCs and the impact of assigning credit on the self-efficacy of the students particularly enrolled in HEIs of India. The results derived after empirical testing of the model show that content and expected learning outcomes have a significant impact on student preference for credit-based MOOCs. Therefore, while designing credit-based MOOCs both content and learning outcomes need serious deliberation as they both are likely to impact enrollment as well as completion of the course. The study adds to the knowledge as it reveals that assigning credit to MOOCs improves the self-efficacy of the students. High self-efficacy is a prerequisite for the completion of an online course (Abeer & Miri, 2014; Wang & Baker, 2015; Jung & Lee, 2018).

6. Conclusion

This study adds a new dimension to the existing conceptual theoretical framework on MOOCs as it analyses the impact of assigning credit to MOOC courses on the self-efficacy of a student. The paper also attempts to analyse the impact of course content, instructional language, and learning outcomes on student perception and preference for program inclusive credit-based MOOCs. These results imply a positive significant relation between course content, learning outcome, and student preference for these online courses. The impact of instructional language is insignificant. These findings are likely to have a potential impact on the educators in designing credit-based MOOCs.The empirical analysis reveals a significant positive impact of assigning credit to the MOOCs on the self-efficacy of the students. Improved self-efficacy has a considerable positive impact on the completion of online courses and a higher completion rate of credit-based MOOCs will aid in achieving SDG4, quality education for all.

Limitations and future research

The present study despite being a novel attempt has its limitations. The study is limited to Delhi NCR and to generalise a pan Indian study is recommended. Moreover, the study has explored specific factors only and there is scope to explore the impact of other factors on credit-based MOOCs. The qualitative study is recommended for more specific outcomes. Moreover, the study has been undertaken from a student perspective only, future research can be undertaken with a focus on other important stakeholders.

References

Abeer, W., & Miri, B. (2014). Students' preferences and views about learning in a MOOC. *Procedia - Social and Behavioral Sciences*, *152*, 318–323. https://doi.org/10.1016/j.sbspro.2014.09.203

Agnihotri, M. A., & Pandit, A. (2021). *Overview and Future Scope of SWAYAM in the World of MOOCS: A Comparative Study with Reference to Major International MOOCS BT - Computational Intelligence in Digital Pedagogy* (A. Deyasi, S. Mukherjee, A. Mukherjee, A. K. Bhattacharjee, & A. Mondal, Eds.; pp. 169–201). Springer Singapore. https://doi.org/10.1007/978-981-15-8744-3_9

Ain, N. U., Kaur, K., & Waheed, M. (2016). The influence of learning value on learning management system use: An extension of UTAUT2. *Information Development*, *32*(5), 1306–1321. https://doi.org/10.1177/0266666915597546

AISHE Final Report 2019-20 - English. (2020). https://www.education.gov.in/sites/upload_files/mhrd/files/statistics-new/aishe_eng.pdf

Alcorn, B., Christensen, G., & Kapur, D. (2015). Higher Education and MOOCs in India and the Global South. *Change: The Magazine of Higher Learning*, *47*(3), 42–49. https://doi.org/10.1080/00091383.2015.1040710

Allan, J. (1996). Learning Outcomes in Higher Education. *Studies in Higher Education*, *21*(1), 93–108. https://doi.org/10.1080/03075079612331381487

Bordoloi, R., Das, P., & Das, K. (2020). Lifelong learning opportunities through MOOCs in India. *Asian Association of Open Universities Journal*, *15*(1), 83–95. https://doi.org/10.1108/aaouj-09-2019-0042

Bordoloi, R., Das, P., & Das, K. (2021). Perception towards online/blended learning at the time of Covid-19 pandemic: academic analytics in the Indian context. *Asian Association of Open Universities Journal*, *16*(1), 41–60. https://doi.org/10.1108/aaouj-09-2020-0079

Chemers, M. M., Hu, L., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology*, *93*(1), 55. https://osf.io/pnfbr/download

Dreisiebner, S. (2019). Content and instructional design of MOOCs on information literacy: A comprehensive analysis of 11 xMOOCs. *Information and Learning Science*, *120*(3–4), 173–189. https://doi.org/10.1108/ILS-08-2018-0079

Ferguson, T., & Roofe, C. G. (2020). SDG 4 in higher education: challenges and opportunities. *International Journal of Sustainability in Higher Education*, *21*(5), 959–975. https://doi.org/10.1108/IJSHE-12-2019-0353

García-Peñalvo, F. J., Fidalgo-Blanco, Á., & Sein-Echaluce, M. L. (2018). An adaptive hybrid MOOC model: Disrupting the MOOC concept in higher education. *Telematics and Informatics*, *35*(4), 1018–1030. https://doi.org/10.1016/j.tele.2017.09.012

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis: Global Edition (7th Edition)*. Pearson Education Limited.

Hew, K. F., & Cheung, W. S. (2014). Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. *Educational Research Review*, *12*, 45–58. https://doi.org/10.1016/j.edurev.2014.05.001

Jung, Y., & Lee, J. (2018). Learning Engagement and Persistence in Massive Open Online Courses (MOOCS). *Computers and Education*, *122*, 9–22. https://doi.org/10.1016/j.compedu.2018.02.013

Kumar, K., Prakash, A., & Singh, K. (2020). How National Education Policy 2020 can be a lodestar to transform future generation in India. *Journal of Public Affairs*, *September*. https://doi.org/10.1002/pa.2500

Kumar, P., & Kumar, N. (2020). A study of learner's satisfaction from MOOCs through a mediation model. *Procedia Computer Science*, *173*(2019), 354–363.

Kursun, E. (2016). Does formal credit work for MOOC-like learning environments? *International Review of Research in Open and Distance Learning*, *17*(3), 75–91. https://doi.org/10.19173/irrodl.v17i3.2403

Lambert, S. R. (2020). Do MOOCs contribute to student equity and social inclusion? A systematic review 2014–18. *Computers and Education*, *145*(November 2018), 103693. https://doi.org/10.1016/j.compedu.2019.103693

Lisa Chamberlin, Tracy Parish. (2022). *eLearn Magazine: MOOCs: Massive Open Online Courses or Massive and Often Obtuse Courses?* 1–6. http://elearnmag.acm.org.ezproxy.apollolibrary.com/archive.cfm?aid=2016017

Liyanagunawardena, T. R., Adams, A. A., & Williams, S. A. (2013). MOOCs: A systematic study of the published literature 2008-2012. *International Review of Research in Open and Distance Learning*, *14*(3), 202–227. https://doi.org/10.19173/irrodl.v14i3.1455

Ma, L., & Lee, C. S. (2020). Drivers and barriers to MOOC adoption: perspectives from adopters and non-adopters. *Online Information Review*, *44*(3), 671–684. https://doi.org/10.1108/OIR-06-2019-0203

Mamgain, N., Sharma, A., & Goyal, P. (2014). Learner's perspective on video-viewing features offered by MOOC providers: Coursera and edX. *Proceedings of the 2014 IEEE International Conference on MOOCs, Innovation and Technology in Education, IEEE MITE 2014*, 331–336. https://doi.org/10.1109/MITE.2014.7020298

Mcauley, A. A., Stewart, B., Siemens, G., & Cormier, D. (2010). *THE MOOC MODEL FOR DIGITAL PRACTICE: Executive Summary! Narrative Introductions*: 64.

Meet, R. K., Kala, D., & Al-Adwan, A. S. (2022). Exploring factors affecting the adoption of MOOC in Generation Z using extended UTAUT2 model. *Education and Information Technologies*, *0123456789*. https://doi.org/10.1007/s10639-022-11052-1

Pant, H. V., Lohani, M. C., & Pande, J. (2021). *MOOCs in Higher Education*. 58–77. https://doi.org/10.4018/978-1-7998-7844-5.ch004

Peltier, J. W., Drago, W., & Schibrowsky, J. A. (2003). Virtual Communities and the Assessment of Online Marketing Education. *Journal of Marketing Education*, *25*(3), 260–276. https://doi.org/10.1177/0273475303257762

Pillai, R., & Sivathanu, B. (2020). An empirical study on the online learning experience of MOOCs: Indian students' perspective. *International Journal of Educational Management*, *34*(3), 586–609. https://doi.org/10.1108/IJEM-01-2019-0025

Rahmadani, D. (2016). Students' Perception of English as a Medium of Instruction (EMI) in English Classroom. *Classroom. Journal on English as a Foreign Language*, *6*(2), 131–144. http://e-journal.iain-palangkaraya.ac.id/index.php/jefl

Rastogi, S., Sharma, A., & Panse, C. P. (2019). Changing facets of higher education in management: a students' perspective. *International Journal of Educational Management*, *33*(6), 1235–1254. https://doi.org/10.1108/IJEM-07-2018-0196

Shah, R., & Goldstein, S. M. (2006). Use of structural equation modeling in operations management research: Looking back and forward. *Journal of Operations Management*, *24*(2), 148–169. https://www.academia.edu/download/37392343/shah.pdf

Singh, G., & Chauhan, R. (2017). Awareness towards Massive Open Online Courses (MOOCs) and their usage for Teacher Education in India. *Asian Journal of Distance Education*, *12*(2), 81–88.

Swayam Central. (n.d.). Retrieved May 8, 2022, from https://swayam.gov.in/nc_details/NPTEL

Trehan, S., Sanzgiri, J., Li, C., Wang, R., & Joshi, R. M. (2017). Critical Discussions on the Massive Open Online Course (MOOC) in India and China. *International Journal of Education and Development Using Information and Communication Technology*, *13*(2), 141–165. https://www.learntechlib.org/p/180647/article_180647.pdf

Tsai, C. L., Cho, M. H., Marra, R., & Shen, D. (2020). The Self-Efficacy Questionnaire for Online Learning (SeQoL). *Distance Education*, *41*(4), 472–489. https://doi.org/10.1080/01587919.2020.1821604

Veletsianos, G., & Shepherdson, P. (2016). A systematic analysis and synthesis of the empirical MOOC literature published in 2013-2015. *International Review of Research in Open and Distance Learning*, *17*(2), 198–221. https://doi.org/10.19173/irrodl.v17i2.2448

Virani, S. R., Saini, J. R., & Sharma, S. (2020). Adoption of massive open online courses (MOOCs) for blended learning: the Indian educators' perspective. *Interactive Learning Environments*, 1–17. https://doi.org/10.1080/10494820.2020.1817760

Wang, Y., & Baker, R. (2015). Content or platform: Why do students complete +MOOCs? *Journal of Online Learning and Teaching*, *11*(1), 17–30. http://jolt.merlot.org/vol11no1/Wang_0315.pdf

Zheng, Q., Chen, L., & Burgos, D. (2018). Certificate Authentication and Credit System of MOOCs in China. In *The Development of MOOCs in China* (pp. 261–276). Springer Singapore. https://doi.org/10.1007/978-981-10-6586-6_13

Zhu, M., Sari, A. R., & Lee, M. M. (2020). A comprehensive systematic review of MOOC research: Research techniques, topics, and trends from 2009 to 2019. *Educational Technology Research and Development*, *68*(4), 1685–1710. https://doi.org/10.1007/s11423-020-09798-x

Zimmerman, B. (1990). Goal Setting and Self-Efficacy During Self-Regulated Learning. *Educational Psychologist*, *25*(1), 3–17. https://doi.org/10.1207/s15326985ep2501