

A Study of the Significance of Massive Open Online Courses (MOOCs) for the Professional Development of Prospective Teachers of Undergraduate Teacher Education Programme

Dr. Amit Ahuja

Abstract

MOOCs are the globally available and accessible academic and professional courses that have migrated from the closed and limited audience in a physical classroom setting to online courses which are available to unlimited number of participants. MOOCs are a potential learning resource in teacher education and support the professional development of teachers. Literature review showed that disengagement of the participants, lack of individual interaction/ attention from the participants and failure to understand the content are some of the plausible reasons due to which most of the MOOCs participants do not complete the course. So, what kind(s) of online learning portals are available for ensuring the access, equity and quality for undergraduate teacher education course? What is the competence level of prospective teachers in using technology to promote their professional growth? How do MOOCs support the professional growth of prospective teachers? What is the perception of the prospective teachers for MOOCs with respect to their professional growth? To answer these research questions a descriptive survey research was conducted by the investigator and ten B.Ed. institutions affiliated to GGSIP university, Delhi were randomly selected for the data collection. It was found that there is a dire need to launch MOOCs through different national co-ordinators at SWAYAM for teacher education in languages other than Hindi. Majority of the prospective teachers had moderate level of competence in using technology for their professional growth. Engaging and interactive academic content, precise presentation of course objectives, assessment, feedback etc. are some of the significant criteria which a B.Ed. institution should consider for deciding and selecting a MOOC for the professional growth of prospective teachers. The study had educational implications for prospective teachers, teacher educators and curriculum planners.

Key Words: MOOCs, Professional Development, Online Learning Portals, Prospective Teachers.

Introduction

Within the domain of open learning, Massive Open Online Courses (**MOOCs**) constitute the most significant innovative movement. MOOCs are the globally available and accessible courses that have migrated from the closed, limited audience in a physical classroom setting to online courses which are open to an unlimited number of participants (**Scholz, 2013**). MOOCs have gained popularity since the year 2013. Higher education institutions offer MOOCs free of charge through the internet and partnerships with external providers such

Dr. Amit Ahuja, Associate Professor, University School of Education, GGSIP University, Delhi.

as Coursera and edX (**Shah, 2020**). MOOCs are among the main types of open educational resources that are digitised materials offered freely and openly for all to use and re-use for teaching, learning and research. The acknowledged advantages of MOOCs are its effectiveness as a learning tool for democratising learning by providing quality education for all (**Dillahunt et al, 2014**), internationalising higher education (**Schuer et al., 2015**), promoting digital competence (**Aljarrah et al, 2020**), enhancing the self-regulated learning strategies (**Zhu et al, 2018**), promoting ongoing professional development and endorsing lifelong learning (**Vivian et al., 2014**) of the learners. From the learners' perspective, MOOCs allow convenience and flexibility while breaking the boundaries of time, space and learning pace, and thus overcome the obstacles like scheduling and location (**Shapiro et al., 2017**). MOOCs also offer an opportunity to study a wide array of subjects with worldwide experts in prestigious higher education institutions, experience online social interactions and promote the learning process without pressure of completion or accreditation (**Hew & Cheung, 2014** and **Koller et al., 2013**). So, how do MOOCs support the professional development of prospective teachers? What kind(s) of MOOCs are online available for the prospective teachers to enrol and pursue? How do these MOOCs ensure the access, equity and quality for the prospective teachers? Are prospective teachers technologically competent enough to complete the enrolled MOOC? What is the perception of prospective teachers for MOOCs as a learning resource? To address these aspects the present study was conducted by the investigator to explore the significance of MOOCs for the professional development of prospective teachers of undergraduate teacher education programmes.

Review of Related Literature

The review of related literature reveals that over the years, MOOCs have arisen as formative tools that may facilitate the learning process of any type of content (**Hidalgo et al 2020**). MOOCs have shown expansion at exponential rate and gained significant popularity among the students and educators (**Aguaded, 2013**). But in a broader context, still MOOCs have to go a long way in terms of satisfaction of students' needs because a high drop-out rate has been observed (**Adamopoulos, 2013**). MOOCs have become an ad-hoc solution for the difficulty that teacher educators face while teaching online (**Schmidt et al, 2022**). MOOCs are a potential resource for the higher education (**Wang & Zhu, 2019**) and serve as an effective tool for teacher education (**Montgomery et al., 2015** and **Nortvig & Gynther, 2017**) and support the professional development of in-service teachers (**Vivian et al, 2014**). MOOCs are effective in supporting the acquisition of content knowledge while the assessment, feedback and practical in-classroom skills required in teaching were deemed to be less suited to MOOCs (**Fyle, 2013**). It was also found that most of the MOOC participants do not complete the course (**Goopio & Cheung, 2021**). Among the plausible reasons for the high dropout rate and disengagement of the learners were the lack of individual interaction/ attention from the teacher and failure to understand the content (**Hone & El Said, 2016**).

To address the issue, that is the significance of MOOCs for the professional development of prospective teachers of undergraduate teacher education programme, with the help of review of related literature following research questions were formulated:

Research Questions

- i. What kind(s) of online learning portals are available for ensuring the three cardinal principles of education policy that is access, equity and quality for undergraduate teacher education courses?

- ii. What is the competence level of prospective teachers in using technology to promote their professional growth?
- iii. How do MOOCs support the professional growth of prospective teachers?
- iv. What criteria do secondary teacher education institutions adopt to facilitate the prospective teachers in selecting a MOOC for their professional growth?
- v. What is the perception of the prospective teachers for MOOCs with respect to their professional growth?

To explore the above research questions, following research objectives were framed:

Research Objectives

- i. To explore the available online learning portals for B.Ed. course with respect to free and subscribed access.
- ii. To explore the available online learning portals for B.Ed. course with respect to equity.
- iii. To explore the available online learning portals for B.Ed. course with respect to quality content.
- iv. To explore the competence level of prospective teachers in using technology to promote their professional growth.
- v. To study the criteria adopted by B.Ed. institutions in selecting a MOOC for the professional growth of prospective teachers.
- vi. To gauge the self-concept of the prospective teachers with respect to technology in promoting their professional growth.

Methodology

The investigator explored the professional significance of MOOCs for prospective teachers enrolled in the secondary teacher education institutions affiliated to GGSIP University, Delhi so, descriptive survey research design was employed.

Definition of key terms:

Professional development: A process of developing the competency of teachers in learning new concepts and adopting a new teaching methodology to excel in a professionally changing scenario for the benefit of the learners (Hooker, 2009).

MOOCs: An online course offered in a flexible learning environment that supports its users without any prerequisites to explore and learn the same material (Downes, 2011).

Under graduate teacher education programme: Two year Bachelor of Education (B.Ed.) programme that prepares professionals for teaching at upper primary, secondary and senior secondary levels (NCTE Regulations, 2014).

Sample and Sampling

Guru Gobind Singh Indraprastha University (GGSIP University), Delhi is a state professional university established by Delhi Government in the year 1998. Education as a professional discipline is offered by the university through Bachelor of Education (B.Ed.) courses in its affiliated institutions. Keeping in view the administrative, academic, time and pandemic constraints, random sampling was exercised in selecting the sample of the study that is ten B.Ed. institutions were selected as the sample of the study. From these ten randomly selected B.Ed. institutions, the research tools were administered on the 39 teacher educators and 198 prospective teachers of Social Science, Science, Mathematics and languages (Hindi and English) subjects.

Tools for Data Collection

Following research tools were used and developed by the investigator for data collection:

- Content analysis was done to explore the available online learning portals for B.Ed. course with respect to access, equity and quality parameters.
- A standardized test by Gupta (2021) was administered on the prospective teachers of B.Ed. institutions to explore their competence level in using technology to promote their professional growth.
- Structured interview of teacher educators of B.Ed. institutions was conducted to assess the criteria adopted in selecting a MOOC for the professional growth of the prospective teachers.
- Structured interview of the prospective teachers of B.Ed. institutions was conducted to gauge their self-concept with respect to technology in promoting their professional growth.

The qualitative research tools developed by the investigator were used for the data collection after establishing their content validity.

Techniques of Data Analysis

Relevant qualitative and quantitative approaches for the data analysis were used for data analysis. Content analysis, as the qualitative approach, a frequency counting, as quantitative approach, were employed for data analysis. So, a mixed research method was employed for data analysis.

Data Analysis:

(i) To explore the available online learning portals for B.Ed. course with respect to free and subscribed access.

In India, SWAYAM is the national platform for MOOCs. At SWAYAM there are nine (9) national coordinators namely

(1) AICTE (All India Council for Technical Education): has been appointed as the 9th National MOOCs Coordinator for the courses that do not fall in the purview of any of the existing national coordinators. The courses offered by AICTE platform are for the university and college teachers of engineering courses.

(2) UGC (University Grants Commission): offers content for 27 postgraduate level courses at SWAYAM in higher education. All these courses have been translated into Hindi, Marathi, Telugu, Malayalam, Tamil, Kannada, Bengali and Gujarati.

(3) CEC (Consortium for Educational Communication): is one of the inter university centres set up by UGC. As national coordinator for MOOCs, CEC offers undergraduate courses in arts, languages, literature, social sciences, natural and applied sciences, management and some professional courses.

(4) IGNOU (Indira Gandhi National Open University): offers MOOCs courses in various disciplines through its Centre for Online Education which is a flexible instructional delivery system. The MOOCs offered are for certificate and diploma level courses.

(5) NIOS (National Institute of Open Schooling): offers 44 courses on SWAYAM out of which 14 courses are at secondary level, 16 courses at senior. secondary level, 4 vocational courses and 10 diploma courses in elementary education.

(6) IIMB (Indian Institute of Management Bangalore): is the first management school in India to offer MOOCs on the edX and offers MOOCs in management education. The supporting partner for SWAYAM courses for the national coordinator IIMB is the Quality Council of India (QCI) which is an autonomous body set up by the Government of India jointly with the Indian Industry represented by Associated Chambers of Commerce and Industry of India, Confederation of Indian Industry and Federation of Indian Chambers of Commerce and Industry. QCI will also provide learner support to IIMB SWAYAM courses and help in dissemination of learner information from time to time.

(7) NCERT (National Council of Educational Research & Training): offers MOOCs in school education (classes IX – XII). At senior secondary level, for 11 courses it is 28 MOOCs for school teachers.

(8) NITTTR (National Institute of Technical Teachers Training and Research): focuses on the quality of engineering education at national level and in the southern states in particular. Its head office is in Chennai. NITTTR aims to foster research in the interdisciplinary area in engineering and offers consultancy and extension services for the growth of technical institutions. NITTTR Chennai offers MOOCs for the teacher training program, along with the other NITTTRs situated at Bhopal, Chandigarh and Kolkata.

(9) NPTEL (National Programmes on Technology Enhanced Learning): as a national initiative was started in the year 2003 by the Government of India with seven Indian Institutes of Technology (Delhi, Bombay, Kharagpur, Kanpur, Madras, Guwahati and Roorkee), as the major stakeholder, and Indian Institute of Science, Bangalore. NPTEL is the largest online repository that offers MOOCs in engineering, basic sciences, selected humanities and social sciences subjects.

NCERT, NIOS, CEC, NITTTR and IGNOU offer MOOCs in teacher education at diploma, undergraduate, postgraduate level. The courses are in the subjects like Educational psychology, Educational Technology, Curriculum and Instruction, Special Education, Early Childhood Education, ICT, Sociology of Education, Communication Technologies, Evaluation and Assessment, Early Childhood Care and Education, Guidance and Counselling, School Organization and Administration, Learning and Teaching, Environmental Studies, Learning Management System- MOODLE, Academic and Research Report Writing, e-content Development, Entrepreneurship Programmes, Pedagogical Courses in the domains of Science Education, Social Science

Education, Mathematics Education and Language Education. The duration of MOOCs may be 4, 6, 8, 12, 16 or 24 weeks with 2, 3 or 4 credit points. The MOOCs may be for core or elective subjects. In the teacher education domain, IGNOU offers MOOCs in Hindi medium also. The MOOCs are free to subscribe but for evaluation, which is through National Testing Agency (NTA), one has to pay the fee. Each course has a self-assessment / evaluation assignment. The assignments may be auto graded or manually evaluated assignments. The auto graded assignments are generally in the form of multiple-choice questions, multiple select questions or fill in the blanks. The manually evaluated assignments may require document upload of essay type questions.

Interpretation: Registration for MOOCs is free but for evaluation the students have to pay the fee. So, the students enrolled in the formal education system, like in university or teacher education institutions, have to pay at their institutional level as well as registration fee for the evaluation component of MOOCs. This financially burdens the students.

(ii) To explore the available online learning portals for B.Ed. course with respect to equity.

The multi-lingual and non-English MOOCs facilitate diverse regional learners with low levels of their previous education. Out of the nine national co-ordinates for MOOCs at SWAYAM, only IGNOU offers exclusive MOOCs in languages other than English. The MOOCs offered through IGNOU in teacher education are in Hindi medium for the subjects like Educational Management, Basic Ideas in Education, Sustainable Development, Pedagogy of Mathematics. The courses are at undergraduate and postgraduate level of 16 weeks duration with 4 or 6 credits. So, these MOOCs suit the non-English speaking students or professionals. The self-assessment component of these MOOCs supports the students or professionals who are enrolling for any MOOCs for the first time.

Interpretation: There is a dire need to launch MOOCs through different national coordinators at SWAYAM for teacher education in languages other than Hindi.

(iii) To explore the available online learning portals for B.Ed. course with respect to quality content.

EdX, FutureLearn and Coursera, are some other available online portals offering MOOCs for teacher education.

-EdX: offers MOOCs in computer science, Business Management, Artificial Intelligence, Data Analysis and Statistics, Engineering, Economics and Finance, Communication, Humanities, Mathematics, Social sciences, Language, Biology and Life-Sciences, Medicine, Education & Teacher Training, Environmental Studies, Electronics, Architecture, Physics. It is not for profit platform established by Harvard and MIT. The duration of courses is of 6 months with 2-3 hours work per week.

Future Learn: is a British digital education platform that was founded in the year 2012 and offers MOOCs in Teaching, Nature & Environment, Creative Arts & Media, Business Management, Politics & Society, Literature, Healthcare & Medicine, Law, History, Science, Engineering & Maths etc.

Coursera: is a global online learning platform that provides access to online courses and degrees from the leading universities and companies. The courses are of less than 2 hours duration, 1-4 weeks, 1-3 months or 3-6 months. Each course is offered at beginner, intermediate, advanced or mixed level. The courses are offered in subjects like health, law, business, math & logic, language training, personal development, teaching, social science, physical science & engineering.

Interpretation: There are a number of online portals for MOOCs which meet quality criteria with respect to course outline, assignments, duration and evaluation. But the duration of MOOCs at some online portals is too long, up to 6 months so these courses have low strength of registered users.

(iv) To explore the competence level of prospective teachers in using technology to promote their professional growth.

The educational test for exploring the competence level of prospective teachers in using technology to promote their professional growth was administered by the investigator on the randomly selected sample that is 198 prospective teachers. Table 1 shows the corresponding statistics after data analysis:

Table 1 Competence level of prospective teachers in using technology for professional growth			
	N	Mean (M)	S.D. (6)
High Level	39 (19.69%)	84.28	7.89
Moderate Level	123 (62.12%)		
Low Level	36 (18.18%)		
Total	198		

The obtained mean value (M) is 84.28 and standard deviation (6) is 7.89. The inferential statistics shows that $M \pm 6$ range marks the competence level of prospective teachers in using technology to promote their professional growth. The range of $M \pm 6$ is 92.17 – 76.39 that means the prospective teachers beyond score 92.17 will have high level of competence in using technology for their professional growth. Prospective teachers with score between 92.17 – 76.39 will have a moderate level of competence in using technology for their professional growth and prospective teachers with scores below 76.39 will have low level of competence in using technology for their professional growth.

So, table 1 shows that there are 39 prospective teachers (19.69%) having a high level of competence in using technology for their professional growth, 123 prospective teachers (62.12%) have a moderate level of competence in using technology for their professional growth. and 36 teacher educators (18.18%) have a low level of competence in using technology for their professional growth.

Interpretation: Majority of the prospective teachers had a moderate level of competence in using technology for their professional growth. The plausible reason for this might be inadequate or lack of training, on the part of the prospective teachers, in using technology before joining the undergraduate teacher education courses.

(v) To study the criteria adopted by B.Ed. institutions in selecting a MOOC for the professional growth of prospective teachers.

Data Analysis: To study the criteria adopted by B.Ed. institutions in selecting a MOOC for the professional growth of prospective teachers a structured interview was conducted. The content analysis of the responses of teacher educators was done. It was found that 73% of respondents opined that engaging quality content, sequencing of the modules, objective assessment and evaluation, clear guidelines and timeline with manageable tasks to be completed, and feedback are some of the criteria that must be taken care of before

selecting a MOOC for prospective teachers. 18 % respondents asserted that duration of a MOOC is one of the important criteria which should be given highest priority as the course duration ranges from 4 to 24 weeks. 9% respondents were of the view that a MOOC should be mobile friendly, that is the platform is suitable for mobile devices and a user can access it as per convenience.

Interpretation: Engaging and interactive academic content, precise presentation of course objectives, assessment, feedback etc. are some of the significant criteria which a B.Ed. institution should consider deciding and selecting a MOOC for the professional growth of prospective teachers.

(vi) To gauge the self-concept of the prospective teachers with respect to technology in promoting their professional growth.

Data Analysis: A structured interview was conducted to explore the self-concept of the prospective teachers with respect to technology in promoting their professional growth. The content analysis of the responses of prospective teachers was done. It was found that 39% of respondents had low self- confidence in using ICT resources. 23% of respondents had comfort in using the internet and other technology devices. Rest of the 38% respondents always relied on getting online or offline training prior to using any technology resource.

Interpretation: The different views expressed by the prospective teachers show that they needed training for using technology otherwise it may lead to a low self-confidence among them for ICT and technology associated devices for their professional growth.

(iv) Project outcome

The project outcomes of this study are reflected as the educational implications for the following stakeholders:

Educational Implications for prospective teachers: The prospective teachers must have elementary knowledge about technology and its usage. They should enrol themselves in a MOOC which is not offered through any core or elective papers as it may lead to their significant professional development.

Educational Implications for teacher educators: The teacher educators should themselves be well versed in using technology so that if any prospective teacher faces some difficulty in completing the MOOC, then instant support may be provided to them rather than reporting to the MOOC developer. The teacher educators should keep themselves updated with respect to the title, objective, national coordinator, evaluation aspects etc. so that with immediate start of semester, the prospective teachers may enrol without any delay.

Educational Implications for curriculum planners: The curriculum planners of undergraduate teacher education programmes should frame the curriculum keeping in mind that MOOCs are the paid courses. So, its leads to a financial burden on prospective teachers. Besides this, MOOCs are offered by a national coordinator but its evaluative phase pertains to some other agency that is NTA so, a coordination between the concerned national co-ordinator and NTA is essential so that prospective teachers may not suffer any academic loss. Many times, results get delayed at the end of NTA and it leads to postponement of their final result or even degree.

Acknowledgement

The above study was conducted through the research grant sanctioned under Faculty Research Grant Scheme (FRGS) of GGSIP University, Delhi for the financial year 2022-23.

Bibliography

- Adamopoulos, P. (2013). What makes a great MOOC? An interdisciplinary analysis of student retention in online courses. In *International Conference on Information Systems (ICIS 2013): Reshaping society through information systems design* (5, 4720–4740). Retrieved from <http://aisel.aisnet.org/icis2013/proceedings/Break-throughIdeas/13/>
- Aguaded, I. (2013). The MOOCs revolution: A new form of education from the technological paradigm? *Comunicar*, 21(41), 7–8. Retrieved from <https://doi.org/10.3916/C41-2013-a1>.
- Aljarrah, A.A.; Ababneh, M.A.; & Cavus, N. (2020). The role of massive open online courses during the COVID-19 era: Challenges and perspective. *New Trends and Issues Proceedings on Humanities and Social Sciences*, 7(3): 142-152.
- Bates, T. (2012). *What's right and what's wrong about Coursera-style MOOCs*. <http://www.tonybates.ca/2012/08/05/whats-right-and-whats-wrong-about-coursera-style-moocs/>
- Borba, M.C.; Engelbrecht, J.; & Llinares, S. (2021). Using digital technology and blending to change the mathematics classroom and mathematics teacher education. In: Hollebrands, K., Anderson, R., Oliver, K. (eds) *Online Learning in Mathematics Education. Research in Mathematics Education*. Springer, Cham. https://doi.org/10.1007/978-3-030-80230-1_2
- Cruz, L. S.; & Vieira, M. D. (2022). Distance education and teacher training: Perspectives for the development of digital skills. In A. Afonso, L. Morgado, & L. Roque (Ed.), *Impact of Digital Transformation in Teacher Training Models* (pp. 54-72). IGI Global. <https://doi.org/10.4018/978-1-7998-9538-1.ch003>
- Daniel, J. (2012). *Making Sense of MOOCs: Musings in a Maze of Myth, Paradox and Possibility*. <http://sirjohn.ca/wordpress/wp-content/uploads/2012/08/120925MOOCspaper2.pdf>
- Dillahunt, T.; Wang, Z.; & Teasley, S.D. (2014). Democratizing higher education: Exploring MOOC use among those who cannot afford a formal education. *International Review of Research in Open and Distributed Learning*, 15(5): 177-196.
- Downes, S. (2011). *The MOOC Guide* <https://sites.google.com/site/themoocguide/home>
- Feng, T.; & Sun, Z. (2021). A study on enhancing teaching presence in teacher education MOOC. In