EFFECTIVENESS OF THE BLENDED MOOC FOR PROFESSIONAL DEVELOPMENT OF TEACHER EDUCATORS

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ABSTRACT
The emergence of information and communication technology has dynamically changed the framework of higher education. With the help of MOOCs, it has provided immeasurable opportunities to massive learners to learn through open online courses. Since 2002 different types of MOOCs have emerged, like- c-MOOC, x-MOOC, NOOC, sMOOC, and a hybrid MOOC/ blended MOOC. B-MOOCs have arisen as a blended learning strategy which is the combination of MOOC platform-supported activities and face-to-face activities within the class in Higher Education contexts.
This paper presents the strategies to analyse the effectiveness of a blended MOOC for the professional development of teachers. This research was conducted using mixed-method research. Qualitative and quantitative tools were used to collect data.
Keywords: MOOC, blended MOOC, teachers, professional development, effectiveness.

Introduction

In the last few years, there is an exponential growth in Massive Open Online Courses (MOOCs) in every field of education. MOOCs have the notable ability to provide access to free online education to a large number of learners from all over the world. MOOCs have best suited for lifelong learning for those, who want to learn on their convenience for those who are working full time and do not get the time due to personal involvements for self-study or have taken a break from formal education. Though MOOCs are very popular but there are concerns and questions regarding the usability of MOOCs (Yousef, 2015). Still, most of the MOOCs are following a teacher-centred, top-down, controlled and centralized learning model rather than a student-centred, decentralized and bottom-top model. Moreover, the lack of interaction between teacher/ instructor and students/ learners is missing in many existing MOOCs. Other challenges of MOOCs are pedagogical concerns, methods being used and techniques of assessment, very less interaction between the learners and between instructors and participants, as well as the lack of technological expertise as also the diversity of MOOC participants. For many participants language as well as the absence of face-to-face interaction among participants and between participants to instructors are also major barriers in MOOCs. All these challenges raise questions on the role and design of MOOCs.

All these concerns give rise to the new design paradigm of Blended MOOC in which the main focus is on a learner-centred approach rather than a teacher-centred one. It overcomes the challenges faced in the other MOOCs by including class (face-to-face) interactions and online learning components, interactive video lectures, various effective assessment methods and feedback as well as caters to the participants from diverse perspectives in a single classroom (MOOC) environment. Ostashewski & Reid (2012); Bruff, et al. (2013); Ghadiri et al. (2013) have stated that blended model can resolve some of the challenges of MOOCs. There are studies suggesting to integrate bMOOC in higher education (Loviscach, 2013; Griffiths et al., 2014; Sandeen, 2013). However, so far very few studies have been conducted to highlight the effective design of blended MOOC environments for the professional development of teachers.

Blended MOOC

Blended Massive Open Online Courses (bMOOCs) has emerged as a new paradigm involving the blended learning strategies in which MOOC platform-supported (online) activities and video-based content with in-class (face-to-face) activities are combined to use in Higher Education contexts (Albo, L., Leo, D.H. & Oliver, M. (2015). There are three models of blended learning which are being used in many blended MOOCs, viz. "blended presentation and interaction" "blended block" and "fully online". Wo and Luo (2022) found that students are having a positive attitude towards bMOOCs as they found it highly interactive, flexible. This helped in developing a better understanding of content.

The MOOC developed in the present study has followed the **'fully online'** model of blended learning in which all the learning activities were designed online. The interaction was through live sessions and discussion forums.

The theoretical framework of Blended MOOC
There are various theories associated with blended learning. For developing the present MOOC on **'Plagiarism: Concept and Precautions'**, the researcher has followed the Community of Inquiry Framework.

The community of inquiry (COI) framework was proposed by Garrison, Anderson and Archer in 2000. It focuses on inquiry-based teaching and learning, which supports the constructivist views of experiential learning. This inquiry-based teaching-learning approach believes in providing meaningful engagement of learners rather than direct instructions about content. (Cleveland-Innes, 2017)

The CoI framework highlights the presence of three necessary elements i.e., *cognitive presence, teaching presence and social presence,* which are essential making the educational experience effective in blended mode.

Cognitive presence is "the extent to which learners can construct and confirm meaning through sustained reflection and discourse" (Garrison, Anderson & Archer, 2001). Cognitive presence represents itself with the help of four components, i.e., triggering events, exploration, integration and resolution. Teaching presence is defined as "the design, facilitation and direction of cognitive and social processes for the realization of personally meaningful and educationally worthwhile learning outcomes (Anderson, Rourke, Garrison and Archer, 2001)." Short, Williams, & Christie, (1976) argued that different forms of media vary in their capacities to transmit "social presence". **Social presence** is "the ability of participants to identify with the community (e.g., course of study), communicate purposefully in a trusting environment, and develop inter-personal relationships by way of projecting their individual personalities." (Garrison, 2009)

In the present MOOC, the researcher has ensured the presence of all the three elements by facilitating the following components:

S.No.	Elements of CoI Framework	MOOC on Plagiarism
1.	Cognitive Presence	Hands on activities, quizzes, terminal assignment (hands on practices) were included, well organized content was provided, reflections in the discussion forum were elicited.
2.	Teaching Presence	Communicated all the necessary information about the course, course goals and objectives were clearly explained, queries were solved in discussion forum, the discussion forum was continuously assessed and the feedback was provided, live sessions were organized on various topics to facilitate participants
3.	Social Presence	Participants were given chances to express their views in the discussion forum, and they were free to comment/post on other's post, there was enthusiastic participation in the interactive live sessions.

Table 1: Components of MOOCs

By following the above elements in the MOOC, the researcher ensured the presence of all the three components of the Community of Inquiry Framework.

Need and Justification of the Study
Most of the studies found MOOCs effective for pre-service training. Offering MOOCs for the professional development of in-service teachers were also found to be a cost-effective programme, in terms of time, training and coaching, administration, material, facilities, travel, transportation and conference fees of teachers and organizers. (Odden & Archibald, et. al., 2002). After using MOOCs for professional development, the teachers can use this knowledge in their classroom.

So, there is a need to train the existing higher education teachers periodically to keep them updated with the latest pedagogies, content, skills required for facilitating the new-age learners. (AISHE, 2018).

University Grant Commission (UGC) has taken the initiative to fulfil on-going professional development needs to train the teachers by holding short-term professional development courses, Inter-Disciplinary Refresher Courses, Orientation Courses, Panel Discussions, Seminars, Workshops, Guest Lectures, etc. on a regular basis conducted by 66 Academic Staff Colleges (ASCs) or Human Resource Development Centres (HRDC) located all over India. (UGC-HRDC, n.d.)

There are a few studies like Zakaria, et. al. (2019) conducted to assess the effectiveness of blended MOOCs, and found a significant differences in academic achievements of experimental and control groups. They concluded that MOOCs are more effective than a traditional classroom for the new generation who are tech-savvy. The MOOC model of the present study has also supported the idea of Morris (2014), who stated that "MOOCs are offered for students to enhance their learning and personalized learning environments". There are researchers like Griffiths et al., (2015), who have highlighted the benefits of integrating MOOCs in traditionally taught courses. Koller, Ng, Do, & Chen (2013) have highlighted that integrating MOOCs with the face-to-face mode of teaching helps increase the course completion rate, however, there are high dropout rates in MOOCs. Garrison & Kanuka (2004) advocated activities may be integrating in both, synchronous and asynchronous mode to strengthen the blended MOOCs.

A study in this area was felt to assess the needs of professional development of higher education teachers as well as their ease of access in getting trained through MOOCs for their professional development. It was felt pertinent to gauge their perception about themselves in terms of their digital fluency, enough, to learn through MOOCs. These questions need to be answered. Hence, the investigator felt the need to develop the MOOC for the professional development of teacher educators and to study the effectiveness of MOOC for the training of teacher educators.

Statement of the Problem
"To Study the Effectiveness of Blended MOOC for Professional Development of Teachers Educators". The problem taken for the study includes the development of a blended Massive Open Online Course for Professional Development of teacher educators and to study its effectiveness.

Operational Definitions
BLENDED- MASSIVE OPEN ONLINE COURSE (B-MOOC)
"Blended MOOC is referred to a course which was developed and offered by the investigator for the professional development of teacher educators on a free and open MOOC platform (Canvas) having both online and face-to-face activities"

PROFESSIONAL DEVELOPMENT (PD)
For the present study, *Professional Development refers to the process of improving and increasing knowledge or making the teacher educators abreast with recent developments in the field of education, working in DIETs/colleges/universities through MOOC.*

TEACHER EDUCATORS
Teacher Educators can be defined operationally for the study as '*the faculty members teaching in university departments of teacher education or affiliated colleges/institutions and are responsible for professional teacher preparation at elementary/secondary and senior secondary level.*

DEVELOPMENT
For the present study, *'the researcher has developed a blended massive open online course for professional development of teacher educators and offered on Canvas platform.'*

EFFECTIVENESS
For the present study, "*effectiveness has been measured in terms of achievement scores of pre-test and post-test on plagiarism, completion of a terminal assignment, the experience of the participants towards using MOOCs of teacher educators before and after completing the course.*"

Objectives
The major objectives of the present study were:
- To develop a blended-MOOC for the professional development of teacher educators.
- To analyse the effectiveness of a blended-MOOC for the professional development of teacher educators.

Research Design

The present study has focused on developing the Massive Open Online Course (MOOC) and testing its effectiveness for the professional development of teacher educators. For which the first researcher has identified the area to develop a MOOC for professional development, developed the MOOC on **"PLAGIARISM: Concept and Precautions"**, offered it and studied the effectiveness of MOOC using **Mixed Method Research.**

For the present study, to achieve the different objectives of the research, the researcher has followed the **'quan→QUAL'** research design. (Johnson & Christensen,2012). The researchers used **one-group pre-test-post-test experimental design**.

Population

The present study involves enrolment through the MOOC platform and anyone can join the course. Therefore, a **numerical description of the population is not possible in this study. All the teacher educators in India constitutes the population for the study because no institutional, territorial jurisdiction of the university or state was fixed for the study.**

Sampling Technique and Sample

Being mix-method research involving MOOC on an open platform, traditional sampling techniques were not possible to use for this research. Therefore, the researcher has applied **an Identical sequential mix sampling design.** In this design, Quantitative and qualitative data are collected one after the other (i.e., sequentially) on the same participants who are selected to represent the same population under investigation (i.e., identical relation) *(Johnson and Christensen, 2012, p. 238)*

For the present study, those teacher educators who have filled the questionnaire before and after completing the course, only those have considered as a sample.

Total 1548 participants enrolled themselves in the course, out of which 303 participants, who are teacher educators completed the course with all modules. So, the sample for the present study is 303.

Tool for Data collection
Pre-test-post-test

To analyse the effectiveness of the MOOC programme for the professional development of teacher educators, pre-test and post-test was used. There were 30 items in the test based on the five modules of the course. Participants were given only one attempt to fill the pre-test. The number of items in the pre-test and post-test was the same. Equal weightage was given to all the modules in selecting the questions for pre-test and post-test. The five modules are understanding plagiarism, types of plagiarism, plagiarism detection software(s), practices to avoid plagiarism and UGC regulations, 2018 for curbing plagiarism.

The test items were validated by nine experts from different universities. Reliability was calculated by the test-retest method. The reliability of the test is .84. The test (pre-test) was given to the participants before starting the course and after 42 days in the form of a post-test after completion of the course. During offering the course the link of the pre-test was made disabled so that participants could not see the items and their responses.

Post-course Survey

At the end of the course, participants were expected to share their opinion and views on various components of the course as well as on the structure and design.

The post-course survey aimed to collect participant's feedback on the course PCP MOOC. The outcome of this helped in analysing the effectiveness of the course/modules.

The items in the tool belong to the following sections- course information, course design and organization, interaction and collaboration, assessment and effectiveness of Massive Open Online Courses (MOOCs), course content, and feedback on modules etc. Participants were given four choices, strongly agree, agree, disagree and strongly disagree to share their views based on their experience and on feedback on the modules they were expected to rate on a scale of 5 to 1 on every component of the modules of the course. 5 stands for most satisfactory/strongly agree and 1 for the least satisfactory/strongly disagree.

Validity and Reliability
Reliability
For the standardization of tools, the test-retest reliability has been calculated. The test-retest coefficient of correlation of 75 participants who appeared for both the tests was calculated and found to be 0.874 which shows a significant correlation at 0.01 levels.

Validity
All the tools were sent to the nine experts who belong to central and state universities. The experts suggested modification to the statements after due consideration of the objectives of the study (the wording of the statements and sequencing of the statements). All the changes recommended by the experts were incorporated and the draft of the final tools was prepared.

INTERPRETATION OF DATA
Analysis of the Objective 1
To analyse the effectiveness of a MOOC for the professional development of teacher educators in terms of their performance in pre-test and post-test.

HYPOTHESIS
In order to test the above objective, the researcher has administered an achievement test comprising items related to all the five modules of the MOOC, which was on offer.
The following hypothesis was tested statistically:

H1: There is a significant difference between pre-test and post-test scores of teacher educators before and after exposure to Massive Open Online Course (MOOC).

t-Test: Two-Sample Assuming Unequal Variances		
	pre-test	*post-test*
Mean	13.37	18.64
Variance	22.45	20.77
Observations	292	292
df	581	
t Stat	**13.69**	**Significant at 0.05 level of Significance.**
t Critical two-tail	1.96	

Table 2: Hypothesis Testing

H1 was the main hypothesis of the experiment. To test this hypothesis, the experiment was conducted with a single group pre-test and post-test design and data were collected using a standardized achievement test. As the hypothesis is a non-directional hypothesis, a two-tailed t-test was used.

The t-stat value is calculated as 13.69, which is more than t-critical (1.96) at 0.05 level of significance for the degree of freedom 581. This leads to the acceptance of hypothesis H1. It can be inferred from this finding that the experimental intervention i.e. the MOOC for Continuous professional development has contributed significantly to increase the achievement of participants in course content.

This analysis shows that the experiment i.e., offering a MOOC on Plagiarism has significantly increased the conceptual understanding of plagiarism, understanding of types of plagiarism, knowledge of plagiarism detection software, practices to avoid plagiarism and the knowledge of regulations to avoid plagiarism in India among the teacher educators.

These findings are reflecting that MOOC is an effective tool for the professional development of teacher educators as the experiment has significantly increased the scores of participants after exposure to the course.

POST-COURSE SURVEY DATA
Participants were asked to fill the post-course survey after completion of the course. Total 308 participants were responded to the post-course survey after completing the course.

The responses of the participants on the statements of the first section reflect that the course design was well understood by the participants. The information of the course was well communicated by the instructor. All the learning objectives of the course were achieved successfully. All the instructions for completing the task (activities, quizzes and discussion forum) and navigating the course were given clearly. It reflects that the course was well planned by keeping the diverse needs of the participants in mind.

The responses on statements of the second section reflect that the course design was well understood by the participants, the course was well organized. The content was presented in small chunks in each module, videos were relevant to the content, activities helped the participants to clear doubts. The course content was up to date. Participants were satisfied with the updated information about plagiarism.

The responses of the participants in section three reflect that the interaction of the instructor with the participants was good. The instructor helped the participants to solve their queries as soon as possible. Participants learnt collaboratively in this course by sharing their views in the discussion forum. There were quality discussions in the forum which enhance the understanding of the participants through each other's experiences.

It reflects that during the course variety of methods are used for assessment in between the course as well as at the end of the course. Which helped the participants to assess their learning or understanding. Activities and quizzes helped the participants to analyse their performance or learning. For the terminal assignment, clear instructions were provided to complete the task and the terminal assignment was based on reflective learning in which participants were supposed to apply all the skills/ techniques, that they have learnt in the course to complete the terminal assignment.

Overall, participants were satisfied with the course content. The course followed a modular approach. Each module was started with a module introductory video which gave the overview of the module, explained the objectives of the module, activities and conditions for the quiz. In between the module, the content was facilitated with the videos which were helpful to understand the concept to the participants. At the end of the module, there was a module-end quiz, which helped the participants to assess their understanding. After each module, a module summary was provided to the participants to quick recapitulate the complete module which was very helpful to understand the concept. So, most of the participants were completely satisfied with the course content and with the design of the modules.

Findings and Discussion
The analysis of tools shows that participants of the 20-59 years of age group were enrolled in the course. As well as there was a mixed group of participants from various disciplines (majority teacher education). They got the information about the course through social media. Before attending the course, they were not much aware of plagiarism.

To analyse the achievement of the participants, they were given the pre-test before starting the course and the same post-test after completion of the course. The result of the pre-test and post-test shows that there is an increase in the scores of the post-test of the participants after completion of the course. The achievement in the scores was on understanding plagiarism, types of plagiarism, plagiarism detection software, practices to avoid plagiarism and regulations on plagiarism in India.

After completion of the course, the researcher collected data through a post-course survey to study the experience of the participants attending the course. The data shows that participants had a good experience of attending the course. The responses showed that the information given in the course was clear and appropriate, learning objectives were achieved successfully and clear instructions were given in the introductory module to navigate in the course and to perform the activities and attempt the quiz. The course was well designed and organized, course activities helped the participants to clear doubts, the course content was available in small chunks, the course content has filled the expectations of the participants. Interaction and collaboration in the course were good. The instructor solved most of the queries regarding the course, announcements were made from time to time to disseminate the information. Various methods were used in the course for assessment. Participants strongly agreed on the section that reflects that MOOC is an effective medium for PDP of teachers/ teacher educators. Overall, the course was effective, modules were well designed and content in the modules was useful in participants' academic work.

Implications

MOOCs have changed the teaching-learning scenario worldwide. Now the learning has become life-long learning irrespective of age, demography, distance, eligibility criteria etc. the implication of MOOCs in different fields can be highlighted in the following points:

- Many universities across the world are using MOOCs, particularly xMOOCs to deliver quality content either freely or at minimal cost;
- Most of the MOOCs are open, only the learner requires a computer with internet;
- MOOCs is useful for accessing high-quality content offered from the best universities in the world.
- MOOCs are useful for developing basic conceptual learning.
- MOOCs also help in developing online large communities of interest or practise;
- MOOCs have given a chance to many conventional institutions to reappraise or redesign their teaching-learning strategies utilizing avenues of online and open learning;
- Irrespective of many concerns and challenges MOOCs is the best medium for the professional development of teachers.

MOOCs have emerged as an opportunity as well as an alternative to traditional distance and open education. The traditional lecturing has been replaced by more facilitative and guided approaches to education. Many students are getting attracted towards MOOCs due its flexibility and less cost. As stated by Yuan and Powell (2013) *"Within the movement towards open education, this new paradigm opens up opportunities for sharing ideas, collaborating between institutions, educators and learners locally and internationally, and facilitating more meaningful engagement in teaching and learning."*

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