



SYSTEMATIC REVIEW ON HIGH DROPOUT RATES IN MOOCs – REASONS AND SOLUTIONS

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Massive open online courses (MOOCs) are among the modern learning initiative that has gained wide popularity in higher education. They play a key role in encouraging self-regulated learning. There is considerable growth in using MOOCs in universities with the rapid development of technology-integrated education. In today's pandemic environment, it is impossible to conduct face-to-face learning sessions. As a solution, MOOCs can be used effectively in blended learning. The availability of many courses on various topics, support from the multilingual interface, flexibility in the mode of learning with study materials, the opportunity to join the courses created by teachers of leading educational institutions, availability of multimedia and interactive tools, and the opportunity to obtain a certificate at the end of the course are some advantages of this MOOC courses. However, one of the drawbacks of using MOOCs is the high student dropout rate. This research study aims at exploring the main reasons for the high MOOC dropout rates and solutions to minimize such dropouts. A semi-systematic review strategy was utilized in conducting the current study. Most of the examined literature was presented in online journals. The data gathered through the systematic review was analysed using qualitative analysis methods. The findings of the study reveal various factors related to the dropout rate of the students in MOOCs under various dimensions such as family-related factors, personal factors, factors related to the course structure and factors related to the teaching-learning process. Introducing a prediction model to identify learners who are at risk for attrition and implementing precautionary interventions, using adaptive approaches such as gamification, increasing cooperation activities, encouraging peer learning, and creating a learner-friendly interface are some solutions that emerged from the review of the literature.

Keywords: MOOCs, dropout rates, solutions, factors behind high MOOC dropout rate

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Introduction

MOOCs (Massive Open Online Courses) are a recent addition to the platforms disseminating open and distance education. Since 2008, MOOCs have been playing a crucial role in advancing global education. Basil et al.(2023) emphasized that this is one of the methods of learning that has received much attention. Although MOOCs have become an important online learning model in higher education, high dropout rates have become a big problem. There are two main types of MOOCs called XMOOCs and CMOOCS each with their own strengths and weaknesses. In both these types of MOOCs, student dropout is a major concern in higher education. Changes in information technologies have influenced learning–teaching processes and have led to the development of a new learning atmosphere. New emerging technologies especially have contributed to the development of new learning environments by affecting the functioning of learning–teaching activities, and have made the provision, circulation, and sharing of education of the same standard and quality possible on a global scale. One of the formations brought about by these developments is Massive Open Online Courses (MOOC), which have emerged as new learning environments.

When compared with the traditional education MOOC courses have different advantages. Despite those advantages many different challenges are there with MOOCs. Sherimon et.al (2021) pointed out that though the MOOCs have attracted a vast number of participants with enrolments growing, only a small number of students who enrol, complete their study. Dalipi et al. (2018) have stated MOOCs are surrounded by different challenges such as many dropouts, certification and graduation, verification of student’s identity, and being unsuitable for complex and engineering education. Though higher education dropout is a common problem,



university students dropping out of a MOOC often have different reasons and challenges in contrast to onsite students.

The aim of this paper is to review the literature on reasons behind high dropout rates in MOOCs and identify the possible solutions as indicated in the literature. Therefore, the following research questions were formulated to guide the literature review.

1. What are the main reasons for the high MOOC dropout rates?
2. What strategies are presented in research literature to address the above problem?

Methodology

A systematic review is a research technique and procedure for exploring and evaluating pertinent research as well as gathering and analysing data from those studies. (Liberati et al., 2009). The primary aim of conducting a systematic review is to locate all empirical data that satisfy the inclusion criteria and addresses a specific research question or hypothesis. To ensure the validity and reliability of research findings, explicit and methodical techniques were followed while selecting and analysing relevant literature (Moher et al., 2009). Usually, a literature review of this kind is carried out to evaluate the current level of knowledge for an area of study. This study employed a semi-systematic review strategy and mostly focused on academic papers that investigated the MOOC dropout factor. According to Ward et al., (2009) this kind of analysis can be helpful to understand theoretical perspectives, or common issues within a particular research discipline or methodology or for identifying the factors of a theoretical concept. Most of the examined literature was presented in online journals. The presentation of the findings was made after reading the chosen papers in the literature review, guided by the research questions. They were selected based on the key terms associated with the subject and the research questions presented in the study, according to the qualitative analysis method which was used. Therefore, “the dropout prediction in MOOCs, the factors affecting student dropout in MOOCs, the strategies to reduce dropout in MOOCs and dropout rates of



MOOCs”, themes were used to generate the data of the research. The findings and conclusions discussed in every article provide insight into the main research theme covered. The results and conclusions of each article provided the perspectives for the main research theme discussed. The relevance of the retrieved studies & abstracts to the topic of the research were then evaluated. Each article’s conclusion and study findings were thoroughly examined. As a result, it was helpful to critically assess critically the many concepts and viewpoints developed by various academics and researchers.

Results and Discussion

Reasons for the High Dropout Rates in MOOCs

Aldowah et al. (2019) conducted a research study to identify the main factors that affect the student dropout rate in MOOCs and implemented a multiple-criteria discussion-making method to identify the core factors affecting the high dropout rate of students in MOOCs. The literature review of this study elicits factors related to four dimensions. The four dimensions are personal factors, family factors, academic factors, and course factors. Personal differences related to the academic skills and abilities of the students, limited experiences related to online learning and MOOCs, and lack of interaction with the tutors can be categorized under the personal factors that affect the high dropout rate of students in MOOCs (Henderikx et al. 2017; Khalil and Ebner 2014; Yamba-Yugsi and Lujan-Mora 2017; Greene et al. 2015; Lee and Choi 2011). According to Aldowah et. al. (2019), personal factors such as those mentioned above have been one of the most common hindrances to the learning process in MOOCs.

These findings are in line with the research done by Dr.I.E. Aydin and Prof. M.Yazici research done in 2020. In that study students were asked about the reasons for dropping the courses. Reasons voiced by learners were grouped under two headings: personal reasons and reasons stemming from the course structure. Personal reasons such as having to give priority to other work, insufficiency of time and being unable



to use the necessary technology at the required level were identified as personal reasons. Similarly, Willging and Johnsons' (2009) study stated that the reason for dropping courses was because they could not carry out their work and education calendars simultaneously. The timing factor has been very strongly discussed through the literature. Onah et al. (2014) has pointed out three concerns about dropping MOOC courses. Most registered students never engaged with the courses, some students engage in courses but do not complete assessments, those who wish to follow and complete a course are hindered by factors such as timing, level of difficulty and digital learning skills. According to them the completion rate for most courses is below 13%. Further they state lack of tutor support also is an issue. Under academic factors, Barak et al. (2016) has stated that the motivation and the feedback given by the tutors are crucial to reduce the dropout rate in MOOCs. In contrast, lack of motivation and poor interactions given by the tutor will lead to dropout rates of the students. Similarly, some other studies have reported that poor instructions provided by the tutor or instructor can be identified as an important predictor of student dropout rate in MOOCs. Aldowah et al. (2020) using a decision – making Trial and Evaluation Laboratory (PEMATEL) method identified 12 factors related to students 'dropout. They identified six key elements, including academic aptitude, previous experience, instructional design, feedback, interaction with others, and support from others, as having a direct impact on student dropout in MOOCs. Other elements like involvement, course length and difficulty, dedication, motivation, and family/work commitments were discovered to have a minor impact on student dropout rates in MOOCs.

Various researchers have studied family related factors that affect the high dropout rate in MOOCs. According to Lee and Choi (2012) lack of social presence and social interaction affect by providing motivation towards learning through MOOCs. Lack of communication with others, lack of peer interaction and less support from the family and the colleagues lead toward the family related factors that affect the high dropout rate of the students. (Yang et al. 2014; Barak et al.2016, Kizilcec and Schneider 2015; Clow 2013; Adamopoulos 2013). Many studies have explored course related factors as well. According to Adamopoulos (2013) the difficult content in the course without learner friendly materials and assignments may negatively affect the student



motivation in completion of the course. Adamopoulos (2013) further emphasizes that if the duration of the course is lengthy, it will affect the dropout rate of the students in MOOCs. Jordan (2015) also expresses a similar opinion stating that the length of the course may affect the completion or dropout rate of the learners. Aldowah et al. (2019) emphasize in their study that if the course is free of cost, it would bring a feeling that it is not compulsory to complete the course. These factors provide an insight for the course developers to seek learner friendly methods when designing courses. Bezerra & Silva (2016) emphasized that lack of social interaction and cooperative activity between the students and group work, lack of sufficient time to follow the course, difficulty in relating concepts with applications, difficulty in following the course content, lack of maturity of the student and high workload affected the high dropout rates in MOOCs.

Strategies that Could Be Adopted to Minimize the High Dropout rates in MOOCs

Various researchers introduce prediction models in MOOCs to cope up with the dropout students and who are at risk for attrition. Most commonly used models are fixed term dropout prediction model, temporal dropout prediction model and dropout prediction performance optimization. Xing and Du (2018) have utilized deep learning algorithm in creating dropout prediction model and has applied a personalized intervention where at risk students are identified earlier so that instructors can use the deep learning strategies to motivate the students in the learning process in MOOCs. Bezerra & Silva (2016) suggested some solutions including the use of an adaptive approach for the course, the adoption of the process of gamification, the increase in cooperative activities between the students in the discussion forums of the courses. Similarly (Gary and Goel) in 2021 emphasized that isolation is also a problem. As a potential solution for this problem, they suggest to encourage peer learning, by supporting learners to find other learners for interaction purpose. They



use some interventions to first identify isolated learners and then recommend peer learners based on their course isolation.

In the case study of Ayidin and Yazici (2020) conducted in AKADEMIA institute of Anadolu university they suggest solutions in three ways, which are managerial, suggestions for content design, and suggestions for interface design. They conclude the reasons for MOOC dropping out as personal based, platform based and design based. As recommendations they suggest better announcements about start and end dates of the courses, variety in online courses, quality of videos, and more user friendly interface.

Study of Borella et al. (n.d.) states that there are large number of interventions trying to increase students' motivation and engagement. Some interventions are related to encouraging learners by generating a greater desire in the course topics or getting the maximum advantages of opportunities to increase their social status. Other interventions are focused on competing learners and trying to reduce their demotivation by proposing a method to cope with their difficulties through email or forum communications, just trying to get absent learners back into the course and collecting information about their reason to leave.



Conclusions and recommendations

This study, being a systematic review, explored reasons for high dropout rates in MOOCs and possible strategies that could be adopted to minimize the issue. According to the reviewed literature, factors affecting MOOC dropouts could be divided mainly into two areas. They are personal factors and institutional factors. Under personal factors, family responsibilities, long working hours, lack of peer interaction, lack of digital literacy and psychological factors can be taken as major issues that induce MOOC participants to drop out. Institutional factors for dropping out of MOOCs included managerial issues, lack of tutor support, difficulties related to the course content and interface-based issues.

As solutions to minimize dropouts, some researchers have identified intervention models to cope up with dropout students and these interventions must be done to meet their needs. The findings of this study indicate that providing better tutor support, engaging peer activities, and a variety of courses, as well as ensuring proper institutional management, and using motivational strategies could help to minimize MOOC dropout.

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