# The Effect of Gamification Elements on MOOCs

Hussien El-Sawy
helsawy3@gatech.edu

***Abstract*—**Gamification is the use of game elements in non-game subjects. MOOCs are Massive Open Online Courses, as it became widely used worldwide specially after the covid-19 pandemic, it is still facing some challenges on retaining enrolled students. This study is going to discuss the connection between Gamification elements and MOOCs specifically "Events" which are considered quests that can be done in a specific period of time in exchange for reward, and how events can be used to increase student's engagement while participating in MOOCs.

## 1 INTRODUCTION

Massive Open Online Courses also known as MOOCs are free web-based courses, with fully open schedule, registration and curriculum for participants (McAuley, Stewart, Siemens & Cormier, 2010). In the revolution of online learning various of worldwide universities, institutes and companies started providing courses for the public through MOOC platforms. And after the COVID-19 pandemic, the use of online-learning increased due to the worldwide lock-in.

MOOCs completion rate is very low, and only 5-10% participants passed and are qualified for completion certificate according to statistics on 3 different courses on different subjects and by different instructors (Vaibhav & Gupta, 2014). Also, the dropout rate in MOOCs reached around 90% due to lack of communication, guidance and engagement (El-Hmoudova, 2014), this issue can be solved by making the platforms more interesting and more interactive with students and participants.

A good approach to increase interaction and engagement of students is gamification. Gamification is defined as "the use of game design elements in none-game context" (Deterding, Dixon, Khaled, & Nacke, 2011), which means the use of game objects and elements like leaderboards, avatars, challenges, events in

non-game subjects like education to reach specific goal like increasing motivation and interaction.

Gamification is considered a good remedy for many students who feel alienated by traditional methods of instruction (Raed, 2017).

This paper will discuss how gamification elements with the focus on events, challenges and quests can be applied to an educational environment to increase the interaction and engagement for students while learning on MOOC platforms, to achieve higher retention and better learning outcome.

## 2 RELATED WORK

There have been few researches that have been conducted to either find the relation between gamification and education and how to implement gamification correctly, or to find the reasons why students dropout from MOOC and the challenges they face during the course period.

In a study made to find the challenges faces students and instructors during MOOCs, the author found that most students feel that lack of guidance and motivation, as well as lack of communication and interaction with peers and/or instructors lead to dropping out of the course, and from instructors perspective they see that students do not interact with them on forums (Hew & Cheung, 2014), also in a study conducted to explore the communication preference of MOOC learners, the research explains that main reason of dropout is absence of peer/professor support (Zhang, Peck, Hristova, 2016).

Impact of gamification was discussed in few researches, and most researches shows that the gamification have a good impact on student's motivation, interaction and overall performance (Vaibhav & Gupta, 2014).
Gamification can be a key factor of massive open online courses success as it was argued in a research that discusses the importance of gamification, and during the study, the author conducted an empirical analysis and the result was that gamification improves user's satisfaction with MOOCs and better engagement during the course (Aparicio, Oliveira, Bacao, & Painho, 2019).

The related work shows that there are researches that show the importance of gamification and how it can be used to increase engagement and motivation for students in MOOCs, but there is a gap that is not covered in the mentioned

related work, that not all elements have the same effect, this paper will discuss the impact of a specific element (events) and how it can be used right to increase interaction, engagement and motivation for students during MOOCs.

## 3 PROPOSED WORK

In this study, it will try to discuss specific gamification elements (events, challenges and quests), and how we can use the mentioned elements to increase engagement and interaction with students in MOOC environments, and how we can use them to get the best effect on students. Also, it will discuss the reasons why people dropout from MOOCs, and how to retain them using gamification elements like the mentioned elements.

The hypothesis in this study that gamification elements as Events, Challenges and Quests can be used to increase engagement and interaction to students, if used with good reward outcome, the reward proposed in this study is discount on certificate or extra points for higher grade outcome, which will lead to the increase in motivation to complete the coursework, with that they can gain a higher learning outcome and the dropout rate in MOOCs will decrease.

The main challenge in gamification to identify the right element to use, not all game elements will give the same effect, in this paper, it will focus on a specific type of elements which is events, quests and challenges and how we can use them right ones to increase the outcome of the MOOC.

Surveys will be conducted and used as the main method to collect data, some closed end surveys might be conducted to get an in-depth opinion about MOOCs, Gamification and what participants need to complete MOOCs.

As quantitative analysis focuses on testing theories and hypotheses, it will be conducted on the first survey to prove the hypotheses that communication, interaction and engagement can be main factors of dropping out of online courses as well as will see how people think about gamification and what are the elements they usually see on MOOCs, afterwards a qualitative research will be needed to focus on exploring ideas about gamification and what are the best elements of gamifications to be implemented to help increase interaction, communication and engagement during MOOCs, so the overall drop rate will decrease.

Methodology:

1- Surveying people about the challenges they face in MOOCs, this will be an open survey for all people on peer survey website, and it will be a closed-ending survey with mainly multiple choices and few open-end questions.
   Target: 25+ participants
2- Surveying people about gamification elements, and what attract them the most, this will be an open survey for all people on peer survey website, and it will be mostly open-end survey.
   Target: 25+ participants
3- Analyzing the results for Surveys.
4- Building a conclusion and discuss the result.

The connection this paper is trying to make between gamification and MOOCs is that we can use "Events" which are quests or challenges open for a specific period of time to increase the engagement between MOOC participants and the MOOC platform and/or students.

Events can be seen as a quest open for a specific period of time, if the participant finished the event in the mentioned time window, he/she can get a reward, the reward itself must be something can attract the participants, and since it is an educational environment, the proposed reward will be "discount on the certificate" or "extra points to get a higher grade on the mentioned course".

## 4 RESULTS

After conducting the surveys to understand participants behavior in MOOCs generally, and what type of gamification elements they usually see on MOOC platforms, the following result shows that most students who joined MOOCs didn't complete 1 or more courses duo to several reasons.

In the first survey, the goal was to understand how students see gamification and what are the challenges they face during MOOCs, and that survey shows that 28 out of 39 students ( approximately 72%) have left some MOOCs without completing it, and it shows that 15 out of the mentioned participants who didn't complete the course got bored during the course and that was the main reason they left the course (approximately 54% ), 30 out of the total participants (approximately 77%) thinks that having peers and/or instructors to engage with would make them more happy to take the course and complete it.

On the gamification questions, the following results were gathered, most of the participants know what gamifications is and saw it in 1 form or another, yet only 4 out of the 39 total participants saw events in any course before (approximately 10%), and 15 out of total participants thinks that events can increase engagement and encourage them to complete the course (approximately 38%), and last but not least 30 out of the 39 participants would join events if we held one weekly (approximately 77%), and 33 out of 39 would join if it have rewards (approximately 85%).

From the above mentioned results, the 2nd survey was built to understand more what participants would like as a reward, which age and what gender would most likely join the event, and what type of events they would like to attend.

The 2nd survey was conducted on 44 participants randomly.

The results of the 2nd survey shows that around 75% of both males and females either agrees or strongly agree that the idea can help increase engagement, and around 5% of the males disagree with that, also around 17% of the females are neutral about the idea, and 3% males.

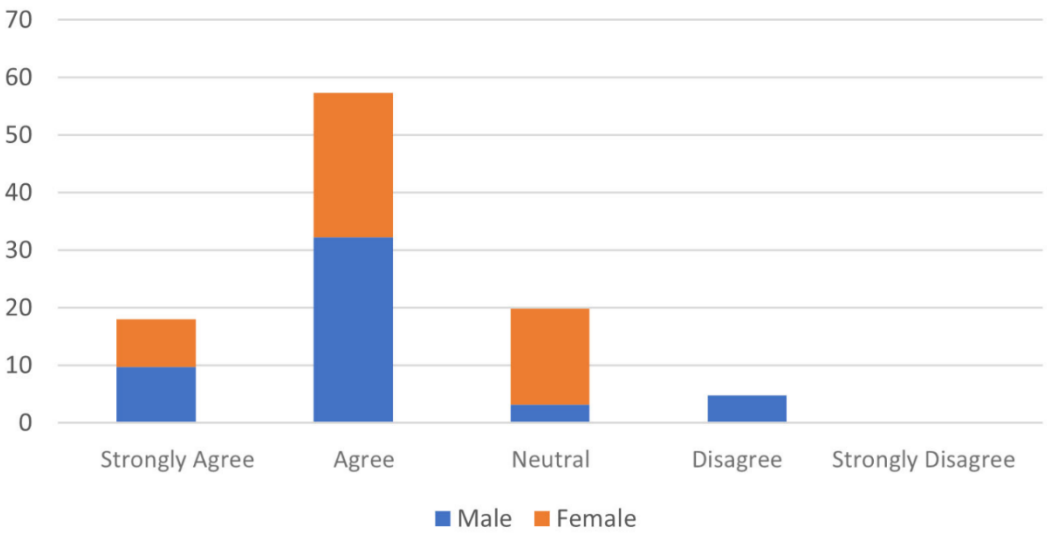


Fig. 1: Can Events Increase Engagement (Gender)

Around 7% of the males and 4% like the idea of events and going to join either with reward or not, and around 19% of males and 16% of females agrees to join if they will get a reward after completing the event, also 13% of males and 30% of females were uncertain about their opinion, and around 6% of males said not likely and 5% said never.

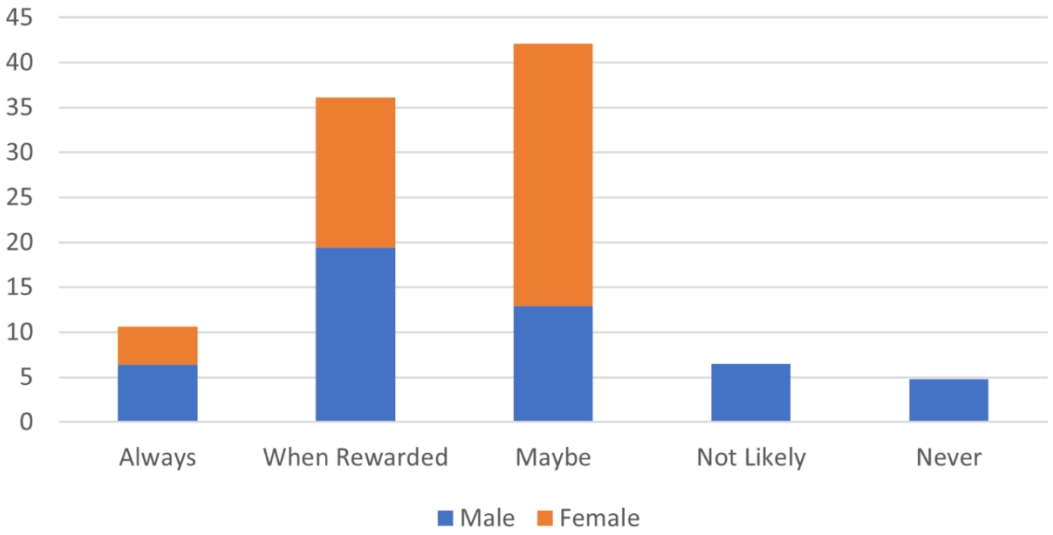


Fig. 2: Are you going to join Events (Gender)

Around 12% of the participants of age 18-29 & 30-39 strongly agree that events would increase engagement, and mostly all others with around 60% in total agrees, yet 50% of participants of age 50+, and a total of 23% are neutral about the idea and 5% of participants from both 18-29 & 30-39 disagree.

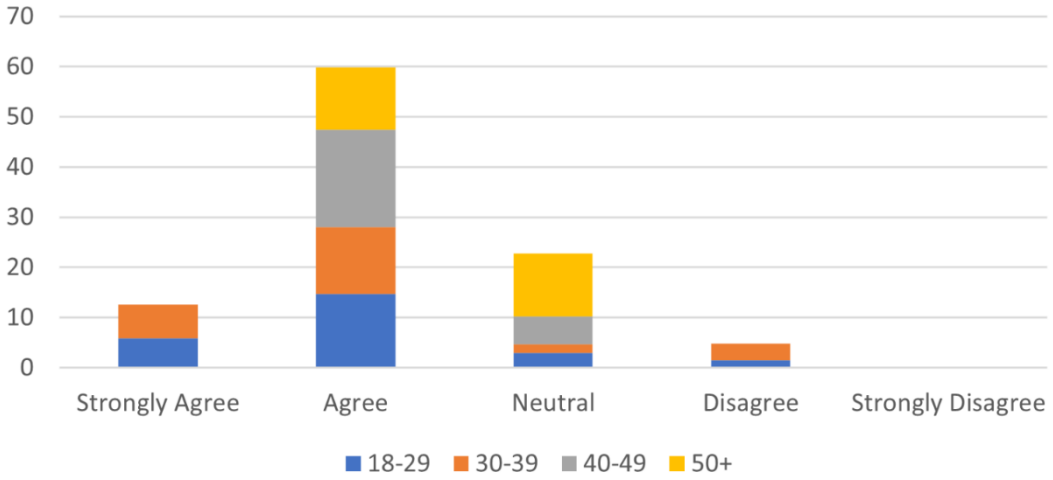


Fig. 3: Can Events Increase Engagement (Age)

Around 43% of the total answers were neutral about joining the events, and 26% would join if they get a reward, 7% going to join with rewards or not, and the rest 24% would not join the events.

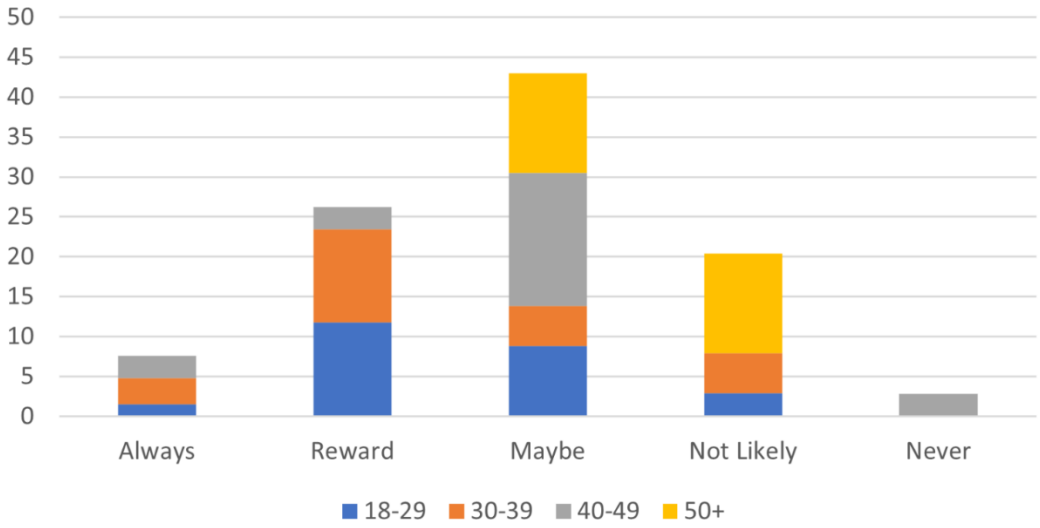


Fig. 4: Are you going to join Events (Age)

Also, most participants are looking forward for rewards that can benefit them in real life, like a chance to get extra points in the subject they are taking, or discount on the official certificate or a certificate of participation in the event, and not any kind of reward would attract them to join the event.

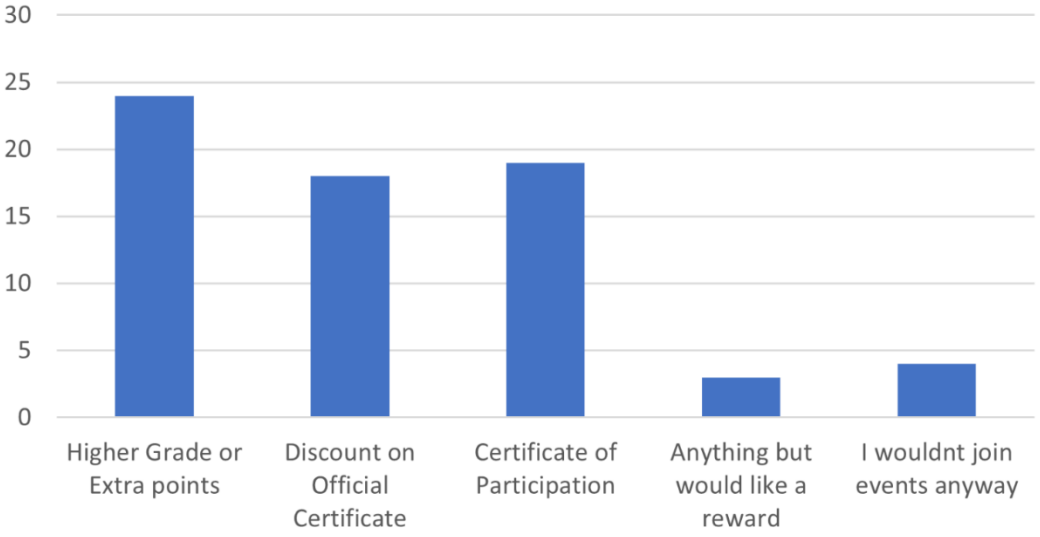


Fig. 5: What Rewards you like to see?

And here we can see the type of events participants are more interested in, as it can be shown in the figure below quizzes and gamified quizzes have the most choices by far, and that gives a good indication of what kind of events can interest them.

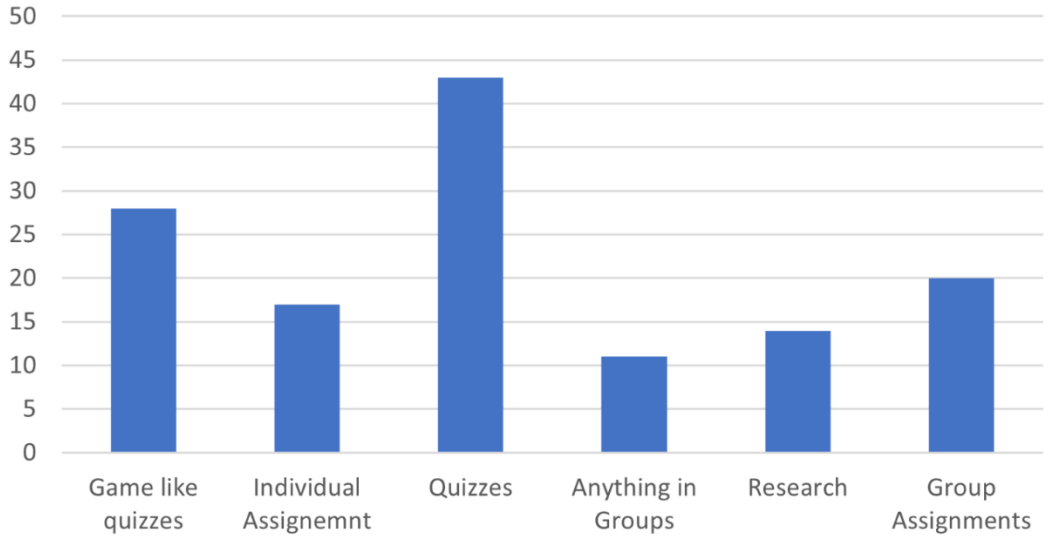


Fig. 6: What activities you like to join?

## 5 LIMITATIONS

This study have a major limitations, mostly related to implementation, as the idea needs to be implemented and tested on real subjects, yet it was all done on empirical statistics and theoretical analysis and assumptions only duo to the lack of time, and also duo to not be able to implement it with any real MOOC platform.

The main limitation can be solved when the event system can be implemented within any of the MOOC platforms and collect enough data after the new course ends.

Also, one of the limitations faced that study is that the surveys was on a small sample of people, this point can be solved with sending the survey for more subjects on different MOOC platforms.

And as most of the survey participants did not see any events before or did not join any in an educational context, the results of the survey may be a bit misleading as after they try the events they might lose interest in it, or might gain more interest in a specific type of events.

## 6 CONCLUSION

In this paper, a set of surveys showed the importance of gamification and how some elements can be used to increase the engagement between students and MOOC platforms which will lead to a higher rate of retention.

Although the surveys had a small number of participants, they were diverse enough to give a good indication about what will be interesting and what will not.

Most of the participants from both genders and most ages were interested in the idea of gamification and events, and were eager to join the events if held weekly at the course, yet most of them are looking forward for a physical reward that can affect their career or real life, so it is concluded that the event alone will not be enough to attract the students and the reward is the most important aspect of the event.

Theoretically the study suggests that the finalized idea based on the surveys is to make a weekly event in the course, this event will be in a form of a gamified quiz or a weekly peer meeting with specific topics to discuss, the student who attend the weekly event will get points during the course and in the end of the course according to the number of points he gathered he will get a prize that will give him higher grade, or discount on the certificate.

The events have to be something new weekly so they do not get bored during them, also the event should be opened and closed in a specific time and have a specific set of quests or challenges, each quest or challenge will give set of points.

## 7 FUTURE WORK

For future work, the model should be implemented in a real course, and we should survey people after the course as well as collect the results of (number of dropped out students from the new course, number of dropped out students from the same course without the new events implemented, number of peoples joined the events, number of peoples participated in all quests in the events) after that a more solid analysis on the idea can be built, and a new enhanced version can be implemented according to the results.

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