Understanding the Effectiveness of Email Prompts to Online Asynchronous Course Participants

Eshana Ranasinghe, Dilini Thoradeniya, Vishaka Nanayakkara, Gaindu Saranga and Malik Ranasinghe
University of Moratuwa, Sri Lanka

enranasinghe1@gmail.com
dilthora@gmail.com
vishaka@cse.mrt.ac.lk
gaindusaranga@gmail.com
malikr.uom@gmail.com

Abstract: A persistent problem in asynchronous online courses is low user retention. Compared to conventional courses, participants require some form of reward or intrinsic motivation to complete these courses which do not have set deadlines or timetables. To remedy this, many online course platforms will send email reminders to participants registered in the course to prompt them to continue their participation. This study is focused on understanding the efficacy of such practices in motivating students to continue a course they would otherwise neglect or drop. This study focuses on selected courses on the online asynchronous learning platform open.uom.lk. The participants of an online asynchronous Project Management course who had enrolled but not completed the course were separated into two groups; students who enrolled but have not started the course and students who started the course but have stopped for over a month. The students of each group were divided into test and control groups, where the test group was sent prompts by email to continue the course which included a link to the course page Using user activity data from the platform the progress of students over the month prompts were sent, and the month after were analysed, and the efficacy of sending email prompts was calculated. 4.45% of the students from the test group began participating in the course again as compared to 2% of the students in the test group. 32 students (0.7%) completed the course in the weeks during and after the email prompts were sent while none of the students in the control group completed the course. This shows sending email prompts has a positive impact on increasing participation in the course.

Keywords: Online courses, User retention, Email prompts, Asynchronous

1. Introduction

Studies have found that online courses have lower retention compared to traditional in-person courses (Baker et al (2016). This is a common problem faced by all online courses but especially so for free asynchronous courses (Brown et al (2023). Although students are initially enthusiastic when signing up for courses, few continue the courses to completion (de Barba, Kennedy, & Ainley, 2016). Higher attrition rates in online courses could be due to a multitude of reasons: an isolated environment with fewer or no direct prompts from instructors or peers to engage in the course material, as well as individual characteristics of the student that could lead to difficulties in self-regulating their learning (Artino, 2007; Stone and Springer, 2019). Therefore it is vital that educators on MOOCs explore different strategies to support the student's ability to self-regulate their learning (You, 2016).

"Nudging" or prompting students to re-engage in the courses is one such strategy that is explored in contemporary literature on online education. This paper examines the use of prompts in a Project Management course available on

open.uom.lk, is an asynchronous learning platform created by the University of Moratuwa to provide free online courses. Since the launch in 2022, there have been over 270,000 registered users with consistent user activity. After the launch of its flagship course 'Trainee Full Stack Developer', a course that teaches Python programming and web development, was well-received, it was decided to release more courses in a larger variety of subjects.

In June 2023, open.uom.lk launched 'Project Management Skills' which is made up of twelve courses in project management. Since its launch, it has had 17,000 registered students enrolled in at least one of the courses. The focus of this research paper is on the foundational course, named 'Foundations in Project Management' which gives students a basic introduction to the topic of project management. Of all the courses, it has the highest registration rate and participation of the available project management courses. While sending email reminders to course participants to continue the course they have started is a common practice among online education providers, it is not a practice utilised by open.uom.lk thus far.

In a study by Brown et al (2023) they found that using emails to 'nudge' students to engage in the course and activities was effective in increasing the participation in the course. The nudges included both reminders about activities the students had to complete and their progress in the course relative to their peers. In the feedback from the students, there was both positive and negative reception to the nudges.

Some students found it to be a helpful reminder and motivating while others found it demotivating and made them feel overwhelmed by the work they would have to do. They concluded that due to the nature of the online courses students experience a greater degree of isolation and a lack of direction in their studies which can lead to feeling overwhelmed by the course work. The email nudges provided some direction in the steps they will need to tackle their work as well as motivation to continue in the course. Rodriguez et al (2022)'s study takes this a step further, examining the effect of personalized nudges- they found that nudges in general reduced attrition rates and positively impacted student performance and satisfaction. Kay and Bostock (2023) examined the impact of an institution-wide 'Early Alert System' that identified students who were at risk of dropping out, and were subsequently sent an email or text message encouraging re-engagement. The study found that students who received the prompt showed higher rates of re-engaging in the course, and also spent more time interacting with the course content. Further, these benefits were sustained for over a fortnight and resulted in the same students re-engaging and enrolling in other courses unprompted.

Brown et al (2016) suggested the cause of the low retention rate of asynchronous online courses is due to an unstructured environment that can lead to students procrastinating as there are no deadlines and no consequences for not continuing with the course. This suggests a major skill students require is both self-control and time management to thrive in a self-paced environment. A student enrolled in a course may be interested in continuing but may lack the internal motivation required to put in the time and work consistently.

In a study by Zavaleta-Bernuy et al (2022) where they sent email reminders to students in an online course to do assignments, they found there was a moderate increase in the number of students who did the homework assignment but it had no impact on the time they started the assignment.

When surveying students they found that while many students found the emails encouraging other students, who were motivated to do the assignment but were unsure how to make progress felt more stressed by the emails. Additionally, it seems to be a necessity for the emails to be personalized to the student to some degree as emails sent with reminders to start an assignment were found annoying by students who were already doing the course.

In a study of the effect of emails on students' academic performance, Ye et al (2022) found that students who received emails performed significantly better than those who did not as well engage with the course material.

The primary motivation for the study is to improve the participation and completion rates of the asynchronous online courses on the open.uom.lk platform. As is typical of free asynchronous online courses many of the courses, especially the introductory courses have a completion rate of 10% or lower. By observing the user behaviour it is evident many of the students who enroll in the course do not make it past the first few lessons, some not even completing the first lesson. This is more likely due to a lack of motivation or disinterest in the course rather than the course itself being especially difficult. As the courses are both free and have no strict deadlines there are no external motivators for students to complete the course in a timely manner. Therefore this study aims to determine if sending emails to students who are not participating in the course is an effective and minimally invasive intervention to promote course participation that could be utilised.

2. Trends in Learner Progression Through the Course

The Foundations in Project Management is the introductory course in the Project Management Programme released on the open.uom.lk platform in June 2023 . This course was chosen as the subject of the study as, of the courses in the Project Management program it has the highest enrollment and completion rate. The first course released by Open.uom.lk has been available for longer and has a much larger number of enrolled students. It was decided to focus on the Project Management course as the numbers of participants would be a more manageable number, with thousands of participants rather than tens of thousands. Additionally, as the system to send email reminders is not an automated system and requires the emails to be sent manually each time, with sending thousands of emails taking the servers several hours, it was recommended to do the study on a smaller scale.

The student registrations and behaviour of the students was tracked by the Moodle system automatically and recorded in course completion reports. A summary is shown below in Table 1. The reports were downloaded from the LMS and analyzed using Excel.

Table 1: Number students in different stages of progress in the course

Categories	Number of Students
Students enrolled but have not started the course	3205
Student who have completed the course	919
Started but not completed (Inactive for more than a month)	1749
Started but not completed (active within the last month)	379
Total enrolled	6248

The course completions over the months from July 2023, when the course was released to April 2024, before the email prompts were sent are shown in Figure 1. The average completions for each day of the week were calculated by recording the completions each day and then adding together the same weekday and dividing by how many of those days occurred in the measured period. This is shown in Figure 3.

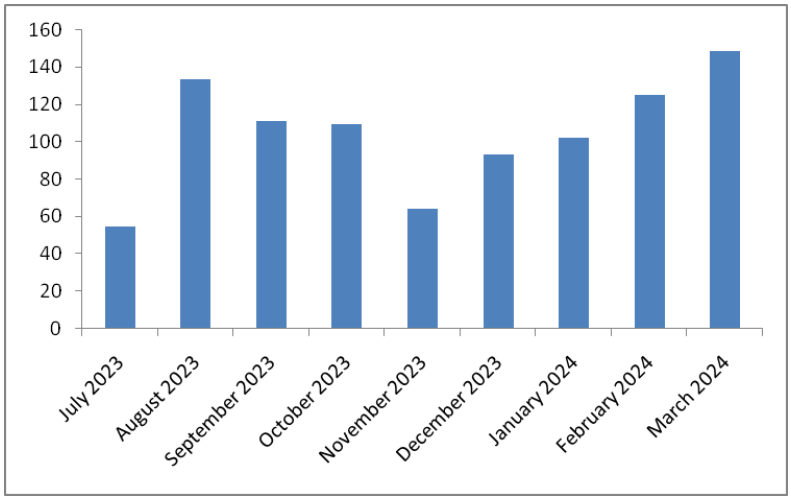

Figure 1: Course completions per month from July 2023 to March 2024

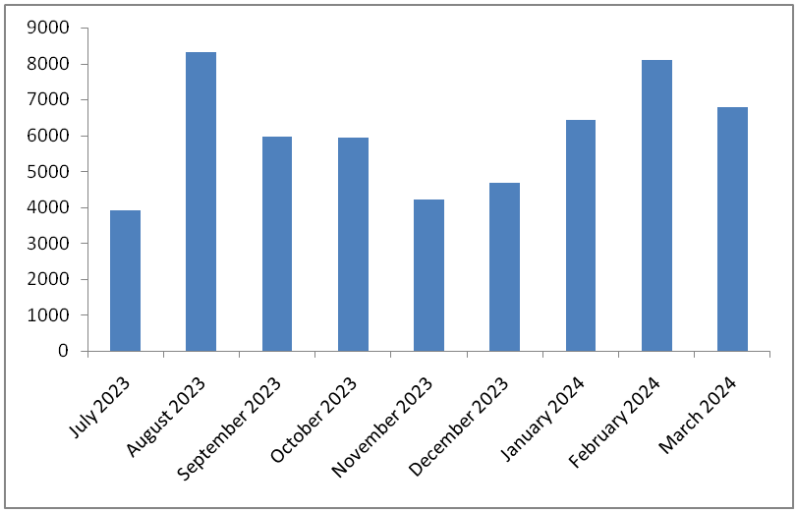

Figure 2: Lessons completed per month from July 2023 to March 2024

3. Methodology

Students who had enrolled in the Foundations in Project Management course but had yet to complete the course were identified from the activity completion reports generated by the Learning Management System (LMS) open.uom.lk is based on. The students were identified into two distinct groups; students who had started the course by completing at least one lesson, and students who had enrolled in the course but had not started it by completing at least on lesson.

The control group was randomly selected from the students from both groups of students who had been inactive for over a month. Due to the relatively small sample size of 4954 students a control group of 5% was chosen to allow the test group to be sufficiently larger to allow the change in behaviour of the students to be easier to measure. It was assumed that while the prompts would lead to some improvement in the participation and course completions the majority of the students would not return to the course.

Emails with prompts were sent to the learners who had not made active progress in the course for over a month. The emails contained text prompts to encourage the learners to continue the course, a graphic containing motivational facts about the course, and a link to the course page. Four emails were sent over 2 months to the learners. Learners were selected based on their inactivity in the course as shown in Table 1. Learners who registered for but had not yet started the course, and Learners who had started but were inactive for more than a month. Over the course of four weeks, emails were sent to the students who had been inactive for over a month. The emails included a reminder to continue the course, a graphic with a motivational saying or statistic about the likelihood of completing the course, and a link to return to doing the course.

An activity completion report which contains details about the activities completed by each student and the date and time on which they were completed was downloaded from the LMS. The activity completion report was downloaded a week after the final email was sent. If the inactivity trend continued even after the emails, they were no longer sent to that student. The report contains data on all the students and the lessons completed from the day the course was launched to the date the report was downloaded.

The results were analysed using Excel. The following criteria were extracted;

the average behaviour of a student, the overall completion rate, the activity completions per day and the course completions per day. It is also possible to determine the average time to complete the course but this is not as important to this study which focuses on primarily encouraging students to complete the course rather than doing so more quickly or within a given time period.

There were 3215 students who had enrolled but never started the course and 1749 students who had begun the course but had been inactive for over a month. A total of 4709 students were sent the email prompts while 245 who made up the control group were not. The behavior of the control group will be used to compare to the test group to see the difference in behavior and if it is influenced by the emails.

4. Results and Discussion

Table 2 summarises the results, and Table 3 gives the analysis of the students in the two categories and their comparison with the control. In the test group 210 of the 4709 students, or 4.45% were active in the course completing at least one lesson in the time after the first email was sent while in the control group there were only 5 active students out of 240 which is 2.08% . These show that the email prompting students to continue the course increased the participation of inactive and less active students. Of the 4709 students in the test group, 4499 remained inactive, either not seeing the email or deciding not to continue the course even after seeing the motivational email.

Table 2: Summary of the Sample

	Test Group	**Control Group**
Active students	210	5
Inactive students	4499	240

Total Students	**4709**	**245**
Percentage of active student	4.45%	2.08%
Total lessons completed	1801	22
Average lessons per active student	8.57	3.14
Course completed	32	0

The data was further analysed as shown in table 3 which further investigated the behavior of the two groups, students who were enrolled but had not yet started the course and students who were inactive for over a month compared to the control group to see if their previous behavior had an impact on how they reacted to the email intervention.

In the test group when comparing students who had begun the course and had since become inactive with students who had not started the course at all i.e. had not completed even one lesson, it is evident that the percentage of students who were previously inactive were more likely to continue the course they started after seeing the email prompts compared to students who had previously not started the course, the percentage of active students being 6.67 % and 3.21 % respectively. This observation is expected as students who had the initiative and interest in the course to complete a few lessons in the course are more likely to continue the course. A similar trend can be observed in the control group where 3.49% of students who were previously active became active after an extended period of inactivity compared to only 1.25% of enrolled but inactive students.

Table 3: Details of the Analysis

	Test Group		**Control Group**	
	Inactive for over a month	Enrolled students who never started the course	Inactive for over a month	Enrolled students who never started the course
Total lessons completed	1079	722	9	13
Average lessons per active student	9.63	7.36	3	6.5
Course completions	23	9	0	0
Students active	112	98	3	2
Total Students	1663	3046	86	159
% Active students	6.67	3.21	3.49	1.25
Lessons completed per student	0.65	0.24	0.11	0.08
Completion per student	0.014	0.003	-	-

As shown in Figure 3 there is a significant increase in the daily lessons completed by students who had previously stopped participating in the course. There are peaks in activity on the day the email was sent or in the days immediately after. Due to the limitations of the mass email function of the LMS it was not possible to

measure how many of the emails were opened and on which days the emails were viewed. The higher levels of activity continued even a week after the last email was sent which is promising. There is a chance that students, after seeing one or two emails got into the habit of doing the lessons and no longer needed external prompts to continue the course.

As observable in figure 3, in the days between March 25th when the students were selected for the study and the first email being sent on April 12th there was some activity where students who had previously been inactive for over a month had decided out of their own volition to continue the course. Even taking this into account as a baseline activity of this group of students it is still far less than the activity of the students after the email prompts were sent. The level of activity during this period is comparable to that of the control group.

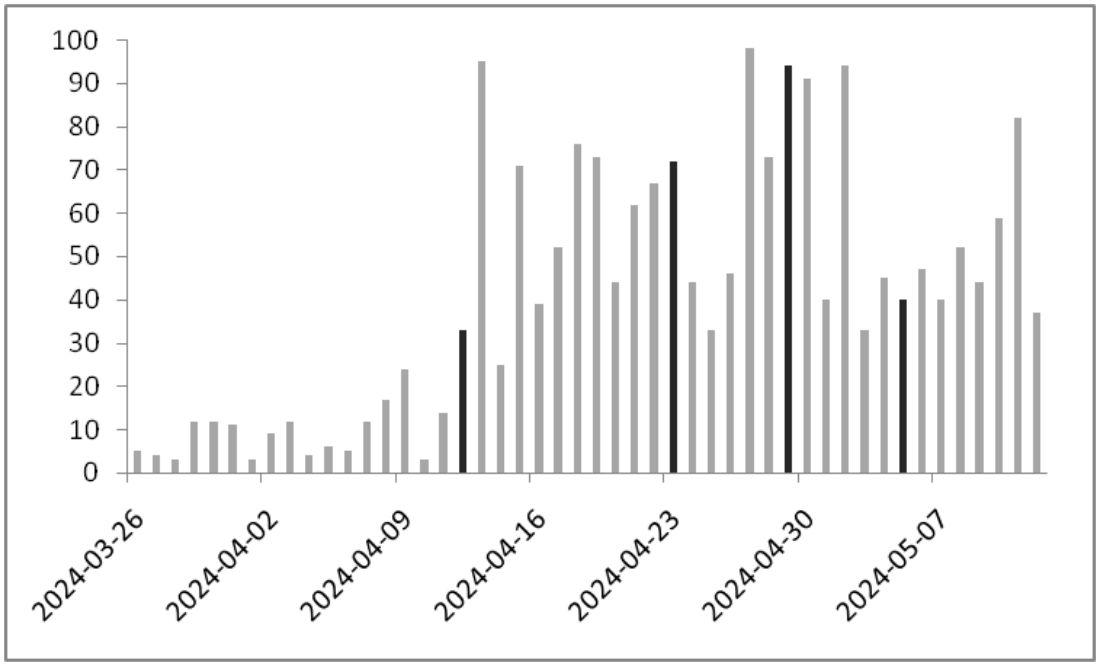

Figure 3: Lessons completed per day. The days highlighted in black are the days the email reminders were sent to students

5. Limitations

Baker et al (2016), stated that students queried and mentioned that constant emails were bothersome. It would also be valuable to know if the motivational nature of the email had an impact on the students wanting to continue the course or if it was simply the reminder and the link to return to the course that was helpful. As the course is free and asynchronous in nature with no deadlines, there is a likelihood the students simply forgot about the course until the email was sent. Identifying a frequency of emails or simply sending an email after a certain length of inactivity rather than in certain time intervals would be more useful.

As none of this essential information could be gathered based on the scope of the current study, it would also be ideal to repeat the study with a larger control as the control group used in the study was relatively small and the results may not be accurately reflective of the behaviour of the population that is not affected by the test.

6. Conclusions and Future Work

This study shows that there is a positive increase in course participation when emails are sent to motivate the students to continue the online course they started or enrolled for but did not start.

This, when compared to the control, can also be identified. While there was some activity of students in the control group it is about half of that from the test group. This shows that a relatively small remedial action such as sending periodic reminders to participants in a course does in fact have a positive outcome on increasing the participation in the course. With this it confirms that sending email reminders to students who have shown little activity in the course for an extended period of time is a good practice to implement by open.uom.lk and is proven to improve course participation and completions.

In between the date the students were selected and the first email was sent, there was some activity with a few students returning to the course after neglecting it for over a month. These could be due to the student's own inherent motivation to continue the course, and not necessarily due to the emails sent as a part of the study.

As future work a longer more in-depth study on the subject matter would be useful, identifying which types of email prompts are most effective and sending a survey to gauge if the students found the emails encouraging or bothersome.

References

Artino, A.R., 2007. Self-regulated learning in online education. Int. J. Instruct. Technol. Dist. Learn, 4, pp.3-18.

Baker, R., Evans, B., & Dee, T. (2016). A Randomized Experiment Testing the Efficacy of a Scheduling Nudge in a Massive Open Online Course (MOOC). AERA Open, 2(4). https://doi.org/10.1177/2332858416674007

Brown, A.; Basson, M.; Axelsen, M.; Redmond, P.; Lawrence, J. (2023) 'Empirical Evidence to Support a Nudge Intervention for Increasing Online Engagement in Higher Education.' Educ. Sci. 2023, 13, 145.

de Barba, P., Kennedy, G. E., & Ainley, M. (2016). The role of students' motivation and participation in predicting performance in MOOCs. Journal of Computer Assisted Learning, 32(3), 218-231. https://doi.org/10.1111/jcal.12130

Kay, E. and Bostock, P., 2023. The power of the nudge: Technology driving persistence. Student Success, 14(2), pp.8-18.

Rodriguez, M. E., Guerrero-Roldán, A. E., Baneres, D. ., & Karadeniz, A. (2022). An Intelligent Nudging System to Guide Online Learners. The International Review of Research in Open and Distributed Learning, 23(1), 41–62. https://doi.org/10.19173/irrodl.v22i4.5407

Stone, C.; Springer, M. Interactivity, connectedness and'teacher-presence': Engaging and retaining students online. Aust. J. Adult Learn. 2019, 59, 146–169.

Ye R., Chen p., Mao Y., Wang-Lin A., Shaikh H., Zavaleta Bernuy A., and Williams J. J. (2022). 'Behavioral Consequences of Reminder Emails on Students' Academic Performance: a Real-world Deployment.' In Proceedings of the 23rd Annual Conference on Information Technology Education (SIGITE '22). Association for Computing Machinery, New York, NY, USA, 16–22.

You, J.W. (2016). Identifying significant indicators using LMS data to predict course achievement in online learning. The Internet and Higher Education, 29, 23- 30. https://doi.org/10.1016/j.iheduc.2015.11.003

Zavaleta Bernuy A., Han Z., Shaikh H., Zheng Q Y., Lim L., Rafferty A., Petersen A., & Williams J. J.(2022) 'How can email interventions increase students' completion of online homework? A case study using a/B comparisons', LAK22: 12th International Learning Analytics and Knowledge Conference