Patterns of Student Engagement in Malaysian MOOCs

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Abstract :Massive Open Online Courses (MOOCs) have gained significant attention among academics and educational practitioners worldwide. Anyone with an Internet connection from any parts of the world can participate in a MOOC. In most cases, it is free and students have access to the teaching videos, course materials and able to participate in the learning tasks individually or as group work. Students can access to the online materials anytime and anywhere in the world. The number of students enrolled in MOOCs has also increased over the past few years. A survey undertaken by The Chronicle of Higher Education in February 2013 suggested that the average MOOC enrolment is 33,000 students (Kolowich, 2013). Stanford AI class, for example, had 160,000 students enrolled when it ran in autumn 2011 (Rodriguez, 2012). In Malaysia, MOOC on the Open Learning platform currently has about 120,824 students enrolled in over 265 courses. Though the number seems to be small as compared to courses in other parts of the world, it is expected to increase in the near future. The Higher Education Ministry at the Ministry of Education Malaysia, has introduced Malaysian Higher Education Plan (2015-2015) that looks into the demands of the 21st century education. MOOC supports the 9th Shift of the Higher Education Blueprint that is Global Online Learning. There are many MOOC platforms but the needs and concern on the teaching and learning through MOOCs remains similar - as to how we might satisfy students' online education needs that they will make them stay engaged to MOOC. In this research, student engagement refers to the degree of attention and interest that students show through their responses, when they are learning, which extends to the level of motivation they have to learn and progress in the enrolled MOOC.

INTRODUCTION

Several studies of particular courses have found out that those who enroll in MOOC have a wide variety of motivations for doing so (Breslow et al., 2013; Koller, Ng, Do, & Chen, 2013). In order for students to complete the course require a certain amount of self-motivation (Hone and El Said, 2016; Liyanagunawardena, Adams, & Williams, 2013). However, motivation does not predict whether a student will complete a course (Breslow et al., 2013). If we manage to engage the students well enough, they might want to complete the course at their own pace. Student engagement will predict their retention in the course. The study also suggested that promoting student motivation and monitoring individual students' online activities might improve course retention. Therefore, this study seeks to explore some learning patterns that might suggest a number of factors that may influence student retention to MOOC.

LITERATURE REVIEW

Most research on instructor student interaction conducted has been looking at the face-to-face settings. A few research studied the impact of this interaction in online environments like the social media, but not MOOC. Therefore, there is a need to better understand how communication between instructor and students can enhanced student engagement in MOOC. According to (Dixson, 2010) the path to student engagement is not about the type of activity/assignment but about multiple ways of creating meaningful communication between students and with their instructor. Students in online environments have the opportunity to spend more time interacting with other students and the instructor than they do in face-to-face environment. Social presence of both other students and the instructor is important.

Similarly, student expectations in online environment are likely to be different than in face-to-face environments. The online and offline engagement highlights the need for research on engagement in MOOC. This paper addresses the pattern in student's engagement to improve our understanding of what could be effective elements in MOOC that are used to engage students.

Most of the time, students were encouraged to take a MOOC of their own choice as part of their development. However, studies suggested that only a small proportion of MOOC participants go on to complete their courses. Self-paced learning, which is often the case in MOOC, relies on the determination of the students to go through the online learning materials and complete the course on their own. Many do not succeed in completing the course. Relatively little is known about the factors that influence their retention. Dixson (2010) found that instructor and student interaction in MOOC was a significant predictor of MOOC retention. Therefore, this paper aims on exploring the patterns of student engagement in Malaysian MOOCs to propose other elements that could contribute to student retention and increase the completion rate of MOOC.

METHOD

A national level MOOC content development competition was carried out in Malaysia recently. The National e-Content Development Competition (eCONDEV 2017) was held in Universiti Teknologi MARA (UiTM) on 15 August, 2017. This competition showcased more than 200 MOOCs in Malaysia. Only the list of active MOOCs showcased and maintained at Open Learning was used as a starting point for this study. This criteria was used because (i) Open Learning is the official MOOC platform endorsed by the Ministry of Education, Malaysia which have fuelled the local interest in MOOCs, (ii) the platforms account for the majority of Malaysian MOOCs to date, and (iii) the platform reflects the higher education sector more broadly, offering courses presented from the majority of higher learning institution in Malaysia. Other individual MOOCs and platforms were excluded in this study.

Out of the total number of competitors in the competition, only 178 MOOCs were shortlisted as they are visible online. The rests of the MOOC were excluded because they were still offline and have not been offered to public. The links to the MOOCs were also not available at the time of this study. Out of the total number of the visible MOOCs selected, only 164 MOOCs were considered active. In this study active MOOCs refers to MOOC that are made available online and has been offered to the public with a substantial number of student enrolment and student-instructor interaction.

Enrolment, student-instructor responses, number of students with progress, median of completion, and the uniqueness of the instructor reply, were selected as the data to be collected from the MOOCs to visualize the pattern of student's engagement as these are the metrics which are most commonly available. Completion rate in this case refers to the percentages of students who had satisfied the courses' criteria in order to gain a certificate of completion. Data was also gathered about the number of 'active users' in courses. Active users in this research refer to students who actively engaged with the course material to some extent (as opposed to those who enrolled but did not use the course at all). For example, this includes having logged in to a course, attempted a quiz, or viewed at least one video.

It should be emphasized that this study sought to be exploratory in nature, identifying patterns of interest from the data as a starting point for further research but not seeking to explain or model the phenomenon. Reliability of the approach is less contentious as the data were provided by Open Learning, which, in this case, is the provider for the MOOC platform.

Data Analysis

Total Enrolment Figures

> Total enrolment numbers comprises a total of 164 courses. The figures range from 1 to 6611 students. Figure 1 shows a total of 164 courses with the majority of enrolment below 500. 153 courses have an enrolment of below than 500 students. Only one course reached more than 6500 student enrolment (with 6611 students to be exact). One more course has 5210 students while one course has 2117 students. Two courses were within the range of 1501 to 2000 students, three courses within 1001 to 1500 students and three courses within the 501 to 1000 range.
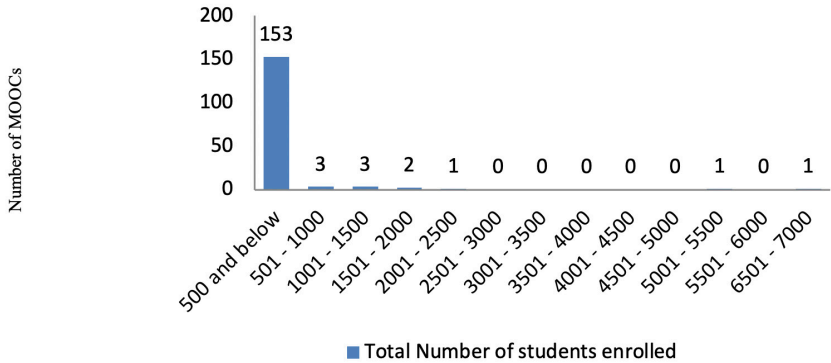
Figure 1. Total Enrolment number for the sampled MOOCs

Students with Progress

Figure 2 shows the percentage of students with progress based on the 164 MOOCs analyzed. 59% of the MOOCs (97 courses) has 0% progress. This means that students just enroll in the course but did not show any progress at all. Progress refers to the number of activities that the students participate (out of the total activities for each course) that contributed towards getting a certificate of completion for the course. 9% of the MOOCs (15 courses) has only 1% to 10 % progress. 13 (7.9%) MOOCs are within 11% to 20% progress. Only 2 MOOCs have a high percentage of student progress, which is above 91%.
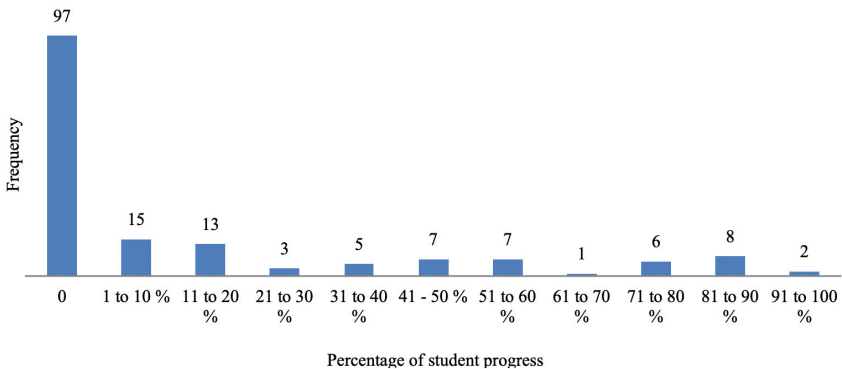

Figure 2. Percentage of students with progress

Students Completion Rates

Completion rates were calculated as the percentage of students with progress (out of the total enrolment for each course) who satisfied the criteria to gain a certificate for the course. This information was available only for 120 courses in the sample. Median of completion and student with progress is shown in Table 1. The data was obtained from Open Learning.

Table 1: The number of Student Enrolment, Student with Progress and Median of Completion

Student Enrolment	Student with progress	Median of Completion
86	71	100
123	89	86.67
37	30	85.48
1649	1228	80
28	15	69.23
1613	1379	68.57
27	15	60.61
25	12	50
10	9	47.62
209	117	46.81
78	62	45.83
3	1	44
26	21	43.75
51	44	41.18
4	2	39.47
229	25	37.5
20	6	33.33
271	112	29.9
56	51	27.78
6	4	26.09
92	71	25
167	68	24.24
2	1	22.5

6	2	21.43
10	6	20.59
392	30	20
19	6	20
10	5	20
1	1	20
12	3	19.67
100	74	18.52
3	1	18.42
24	10	18.18
5	3	18.18
1097	496	17.65
88	14	15.89
12	3	14.71
37	2	14.13
6	5	13.33
6	3	13.11
1469	49	13.04
101	91	13.04
114	23	12.5
56	34	12.5
3	1	12.5
56	10	12.06
180	7	11.76
129	56	11.76
6	2	11.76
13	2	11.54
7	5	11.11
4	1	11.11
56	18	10.59
9	2	10.53
7	4	10
79	42	9.84

36	4	9.26
2117	729	9.09
34	3	9.09
3	1	9.09
83	6	8.82
197	103	8.57
3	2	8.57
7	1	8.51
8	5	8.47
11	1	8.33
8	6	8.33
5	3	8.33
27	4	7.89
9	1	7.69
7	2	7.69
6	3	7.69
43	35	7.5
567	52	7.41
211	137	7.14
1	1	7.14
43	8	6.54
12	2	6.25
7	3	5.97
1	1	5.88
22	3	5.56
42	36	5.5
10	2	5.41
644	50	5
23	4	5
7	1	5
7	1	5
29	27	4.92
6	2	4.84

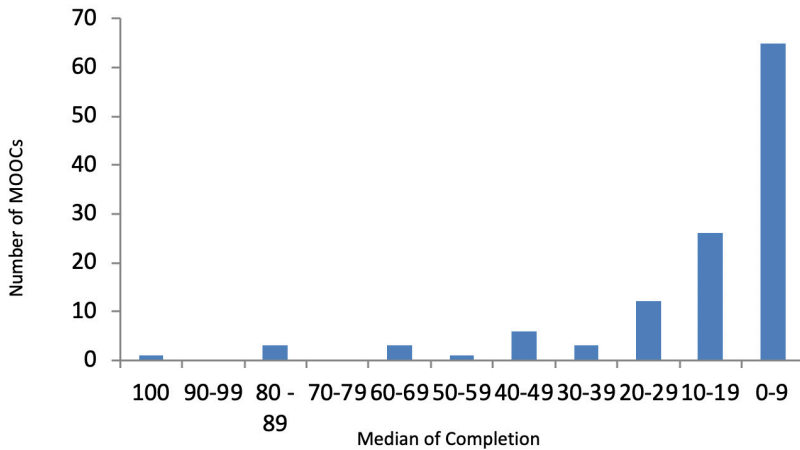|		
53	8	4.81
50	10	4.81
5	3	4.76
586	235	4.55
66	60	4.4
5	1	4.35
5210	6	4.29
7	3	4.26
5	3	4.17
55	14	4
10	1	4
419	3	3.85
42	22	3.85
3	1	3.33
39	13	3.23
12	2	3.23
332	77	3.17
108	3	3.13
244	19	3.08
4	2	2.78
12	7	2.47
6611	14	2.44
98	16	2.27
83	34	2.22
50	7	2.22
1113	555	1.9
164	19	1.89
35	3	1.69
4	1	1.64
1	1	1.39
4	1	1.03

Figure 3. Students Completion Rate

The majority of the courses (n=65, 54%) have median completion of less than 10. 26 MOOCs have median completion of less than 20%. 12 MOOCs have median completion of less than 30. Only 1 MOOC has a median completion of 100.

Student Engagement

The most common definitions of engagement across the duration of courses used by the sources were the number of students accessing resources, or completing assignments. Only 49 courses showed some activities in student engagement (Table 4). The engagement level ranges from 0.0092 to 1.3382. This data was provided by Open Learning, based on (i) the number of comments over the number of students, that reflect instructor and student replies, (ii) the number of replies from the students and instructors over the total number of comments, (iii) the percentage of unique comments by authors based on the number of students, and, (iv) the percentage of students with progress over the number of students' enrolment.

Table 2: The number of Student Engagement and other related data

Course	Students Enrolment	Comments	Instructor Replies	Student Replies	Students with Progress	Median Completion	Unique Comment Authors	Engagement
1	1649	7543	138	3303	1228	80	1420	1.3382
2	26	226	0	38	21	43.75	21	0.9535
3	79	797	35	208	42	9.84	46	0.9522
4	123	1671	18	164	89	86.67	88	0.7660
5	92	353	63	43	71	25	74	0.7152
6	43	178	10	30	35	7.5	37	0.6515
7	83	387	23	133	34	2.22	52	0.4824
8	271	4227	105	517	112	29.9	125	0.4375
9	211	1148	18	245	137	7.14	108	0.4142
10	209	1459	0	219	117	46.81	117	0.3284
11	100	301	10	47	74	18.52	65	0.2742
12	28	149	0	15	15	69.23	17	0.1742
13	56	348	29	37	18	10.59	21	0.1421
14	27	173	0	11	15	60.61	15	0.1257
15	1613	17542	34	232	1379	68.57	1247	0.1090
16	78	552	1	12	62	45.83	58	0.0985
17	56	181	23	30	10	12.06	31	0.0936
18	51	127	1	6	44	41.18	28	0.0650
19	66	193	2	3	60	4.4	57	0.0595
20	644	1783	782	406	50	5	262	0.0583
21	129	460	1	19	56	11.76	103	0.0537
22	37	530	0	2	30	85.48	27	0.0320
23	56	44	1	3	34	12.5	20	0.0155
24	42	39	0	4	22	3.85	11	0.0131
25	392	459	10	77	30	20	259	0.0112
26	1097	816	1	115	496	17.65	211	0.0092
27	244	184	5	54	19	3.08	62	0.0048

28	29	17	0	1	27	4.92	4	0.0044
29	1113	535	1	32	555	1.9	259	0.0034
30	586	238	27	26	235	4.55	47	0.0029
31	56	161	0	1	51	27.78	10	0.0029
32	24	5	0	1	10	18.18	4	0.0029
33	25	8	1	0	12	50	3	0.0023
34	39	7	2	1	13	3.23	3	0.0020
35	101	86	1	0	91	13.04	21	0.0019
36	164	64	7	14	19	1.89	20	0.0018
37	35	15	0	2	3	1.69	12	0.0017
38	2117	2806	5	37	729	9.09	369	0.0012
39	567	274	6	12	52	7.41	228	0.0012
40	37	26	3	0	2	14.13	6	0.0007
41	332	50	1	15	77	3.17	19	0.0006
42	22	5	0	1	3	5.56	2	0.0006
43	50	22	0	1	10	4.81	7	0.0006
44	167	12	1	4	68	24.24	5	0.0004
45	50	5	0	1	7	2.22	4	0.0002
46	98	13	0	1	16	2.27	9	0.0002
47	197	14	0	1	103	8.57	8	0.0001
48	108	21	2	4	3	3.13	7	0.0001
49	83	77	0	1	6	8.82	8	0.0001

FINDINGS AND DISCUSSION

The findings here showed that the majority of courses (54%) have been found to have completion rates of less than 10. The completion rate refers to the percentage of enrolled students who satisfied the courses' criteria in order to earn the certificate of completion. Majority of students (59%) just enrolled in the course but did not show any progress at all and those who showed progress may not also have high engagement level. Based on the findings, it can be concluded that high engagement level is not determined

by the number of replies both students and instructors make but is actually reflected through the percentage of unique comments by authors and also the student progress. The pattern showed that students who were highly engaged in MOOC had shown effort to complete the activities, made comments and attempted to complete the course tasks. In many cases of the Malaysian MOOCs in this study, having a high student enrolment does not promise a high completion rate. While completion rates as a percentage of active students span a wider range than completion rates as a percentage of total enrolments, there is a strong skew towards lower values. The differences here would be worthwhile to explore in further detail to explore features of course design that may account for the wider variation observed.

The findings could also suggest that there are potentially many ways in which MOOC students may participate in and benefit from courses without completing the assessments. The low completion rates observed when defining completion as a percentage of active learners in courses is interesting and warrants further work to better understand the reasons why those who become engaged initially do or do not complete courses. This is not to say, however, that completion rates should be ignored entirely.

CONCLUSIONS

This paper explores some patterns of students engagement in Malaysian MOOCs. This study has only considered some data between enrolment and completion. Information about enrolment numbers and completion rates were gathered from Open Learning. 164 Malaysian MOOCs were analysed in terms of enrolment, student-teacher responses, number of students with progress, median of completion, and the uniqueness of the instructor's reply, to visualize the pattern of student's engagement. The findings from this study is hoped to contribute to the understanding of student's engagement which could later perhaps mapped out their performance in MOOC.

Looking at completion rates is a starting point for better understanding the reasons behind them, and how courses could be improved for both students and course leaders. For example, the relationship between enrolments, completion, and course length is an interesting issue for MOOC course design, balancing the higher enrolments with the lower completion rates

of longer courses. Figures about how many students achieved certificates obscure how many students attempted to gain a certificate but did not meet the criteria. Given that MOOCs are offered free of educational prerequisites, striving to improve teaching on courses so that students who wish to complete are assisted in doing so is an important pedagogical issue.

A limitation of the approach used here is that the data neglects the student voice. While these approaches can identify brief patterns, they are unable to explore in detail the reasons behind the patterns observed. An area to consider in future could be the impact of different assessment types, linked to the criteria for achieving a certificate of completion. MOOCs should be considered as a new type of virtual organization that is composed by educational contents, technology and learners, rather than a simple combination of learning materials and platforms. Building a deep understanding of user needs is crucial for future evolution of MOOCs.

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