

A LESSON LEARNED FROM UNIVERSITAS INDONESIA MASSIVE OPEN ONLINE COURSES

**FA Triatmoko Heru Santoso¹, Novianthi Dian Purnamawati², Sinta Krisdamayanti³,
Anak Agung Ayu Maharani⁴**

^{1, 2, 3, 4}*Universitas Indonesia (INDONESIA)*

Abstract

Universitas Indonesia (UI) initiated online learning in the early 2000s and focused on building massive open online courses (MOOCs) in early 2020. UI sees MOOCs as a vital strategy for providing broader and fairer quality education access and increasing the quality of teaching. It also coincides with the Covid-19 pandemic, which forced higher education institutions to accelerate the digitalization of learning. The initiatives consist of developing MOOCs content, faculty training on distance learning and MOOCs, developing MOOC learning management systems, and preparing the required policies. In 2021, UI created 132 MOOCs and opened 92 MOOCs for the public through UI Center for Independent Learning (CIL) and Indonesia Cyber Education Institute. From this study, economic and business topics are the most attractive compared to other topics, with the faculty of medicine as the most productive MOOC creator. The highest completion rate is from nursing MOOCs and the lowest is from pharmacy MOOCs, with an overall average of 22.72% which is higher than the completion rate from all edX participants. Most of the UI MOOCs are delivered through a self-paced mode, and the completion rate is significantly lower than the instructor pace MOOCs. Although mainly delivered through self-paced mode, we suspect that not all MOOCs are truly self-paced. UI MOOCs encounter some challenges, such as completion rates, and instructor difficulties in creating video content and using the MOOC platform. We identify the main factor that might contribute to the success of UI MOOCs participants is the presence and feedback from the lecturer or instructor, both instructor-paced and self-paced mode. We also identify some limitations and recommend some studies to be conducted.

Keywords: MOOC, distance learning, program evaluation.

1 INTRODUCTION

The term Massive Open Online Course (MOOC) was coined in 2008 by Dave Cormier at the University of Prince Edward Island when referring to the Connectivism and Connective Knowledge Course developed by Stephen Downes and George Siemens (Zhu, Bonk, & Sari, 2018), which was attended by 25 fee-paying students, and 2.300 others participated for free through several applications including RSS feeds, blog post, virtual worlds, and synchronous online meeting (Littlejohn, 2013). This course was not content-focused, but on the network among participants to share resources and contributions across the network. This type of MOOC was called a cMOOC based on the connectivism pedagogical approach (Stracke, Downes, Conole, Burgos, & Nascimbeni, 2019).

Some experts provide many definitions of MOOCs. Littlejohn (2013) defines MOOCs as a course aiming at large-scale interactive participation and open access via the web. Furthermore, (Guo, 2017)

mentions MOOCs as the use of internet platform sharing, free from time and place restrictions, and widely disseminated free curriculum resources. Deng, Benckendorff, & Gannaway (2019) defines MOOCs are open, large-scale web-based courses designed and delivered by accredited higher education institutions and organizations in which anyone with a smart device and internet connection can participate, regardless of age, gender, geographic location, or education background. Nowadays, MOOCs can be described as articulated sets of learning activities and resources, web-based, usually free of charge and with no prerequisites, which can be accessed simultaneously by hundreds of users (Azevedo & Marques, 2017). In general, there are 2 types of MOOCs delivery modes, self-paced and instructor-paced. Kocdar, Karadeniz, Bozkurt, & Buyuk (2018) differentiate the modes below.

Table 2: The Differences between Self-Paced and Instructor-Paced

Self-paced courses	Instructor-paced
• Allow students to take courses at their own pace • Do not follow a set schedule • All the course materials become available when the course begins • May have no start or due dates for exams and assignments • Delayed feedback by the instructor or tutors • Flexible regarding time and/or place	• A structured learning environment that is led by a faculty member or instructor, who sets the pace of the class • Follow a set schedule • Course materials become available at specific times as the course progresses due dates for assignments, start and end dates for exams • Immediate feedback from the instructors • May not be flexible regarding time and/or place

The number of MOOCs began to increase in 2012 which was referred to as the “Year of The MOOCs” by the New York Times (M. Stracke, Downes, et al., 2019). Despite growing on a much larger scale, one of the prominent criticisms of MOOCs is their low completion rate or the percentage of enrolled students who completed the MOOCs. Based on recent research on MOOCs, it was found that the completion rate varies from 0 – 52.1% (Jordan, 2015), and the current average completion rate is approximately 15% (Jordan, 2015b). MOOCs completion rate is thought to be influenced by course design (Kim, et al., 2021), including course length (longer courses having lower completion

rates), start date (more recent courses having higher percentage completion), and assessment type (courses using auto grading only having higher completion rates) (Jordan, 2015); teacher and facilitator presence feedback and interaction (Hone & El Said, 2016; Goh, Ayub, Wong, & Lim, 2017).

Universitas Indonesia (UI) the leading university in Indonesia, began to open its courses for partner university students through the ministry initiatives (PDITT/Pembelajaran Daring Indonesia Terbuka dan Terpadu program) in 2014. Later UI focuses on building massive open online courses (MOOCs) in early 2020. UI sees MOOCs as a vital strategy for providing broader and fairer quality education access and increasing the quality of teaching. It also coincides with the Covid-19 pandemic, which forced higher education institutions to accelerate the digitalization of learning. The initiatives consist of developing MOOCs content, faculty training on distance learning and MOOCs, developing MOOC learning management systems, and preparing the required policies. In 2021, UI created 132 MOOCs and opened 92 MOOCs for the public through UI Center for Independent Learning (CIL) and Indonesia Cyber Education Institute (ICE-I). To see the effectiveness and efficiency of UI MOOCs initiatives, the researcher conducts a study to see the implementation of MOOCs organized by UI in the 2020-2022 period. This study will be valuable for UI in developing its MOOCs and contributing to MOOCs research in Indonesia. In addition, this study investigated the following research question:

Q1: How is UI MOOCs overview?

Q2: What factors might contribute to the success of UI MOOCs participants, indicated by each participant's completion rate?

2 METHODOLOGY

The data being analyzed is 92 UI MOOCs that were implemented from 2020-2021, which contains 2 types of data. The first data is statistical information from a total of 132 MOOCs developed by UI. It consists of descriptive data, such as the number of MOOCs, number of participants, and number of faculty. Other data includes the completion rate percentages for each participant in every course. The completion rate will be used as an indicator of participants' success, gathered from the UI

MOOCs platform using Course Progress Block. We also categorized UI MOOCs based on the delivery mode (self-paced or instructor pace). The data is analyzed using Jamovi software (version 2.3.18). The second data is the qualitative data, which is collected from the MOOCs instructor interview and course review results which includes course length, assessment type, and teacher-student interaction.

3 FINDINGS AND DISCUSSION

3.1 Findings

3.1.1 UI MOOCs Overview

The following is data on 132 MOOCs that have been developed by all Faculty/Programs at UI in 2020-2021. From figure 1, the Faculty of Medicine has the highest number of MOOCs content, while Administrative Science and Dentistry only develop 1 MOOC. From the data in figure 1 and table 2, we identify a total of 92 MOOCs implemented ($M=7$) and attended by 6.777 participants with an average of 521 participants and a 22.72% completion rate. The highest total number of participants comes from the faculty of medicine ($N=1896$, $M=73$, $N=26$ course), but the highest average of participants comes from the faculty of economics and business ($N=1234$, $M=247$, $N=5$ courses). The highest completion rate is from nursing MOOCs ($M=44.5\%$), with 20 participants, and the lowest is from pharmacy MOOCs ($M=4.60\%$) with 5 participants.

Figure 9: Number of MOOCs in each faculty/program

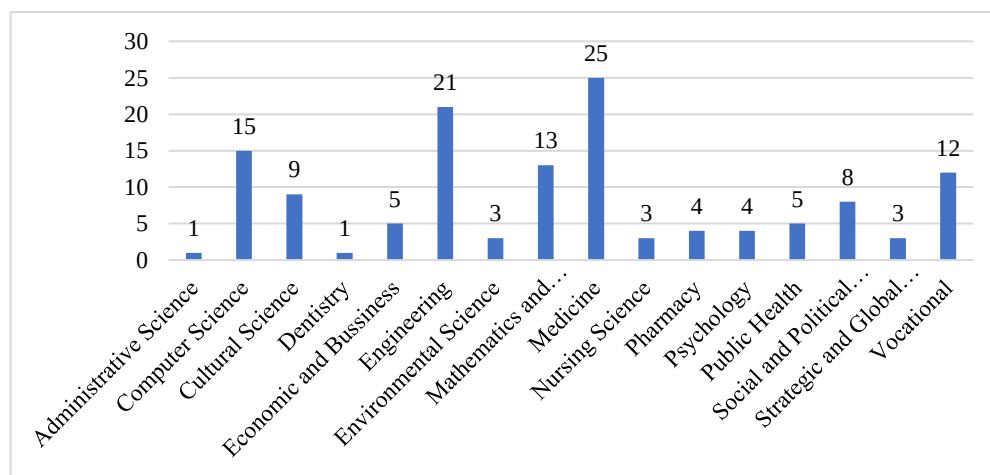


Table 3: MOOCs participants & overall completion rate

Faculty	# Of Courses	# Of Participants	AVG of Participants/ Course	% Completion Rate
Mathematics and Natural Science	10	309	31	17.1
Computer Science	14	1250	83	9.39
Economic and Business	5	1234	247	18.1
Cultural Science	9	326	36	24.3
Social and Political Science	6	86	14	34.0
Vocational	6	331	41	6.53
Engineering	7	505	72	27.8
Psychology	1	86	86	27.6
Administrative Science	1	49	49	33.7
Pharmacy	1	5	5	4.60
Nursing Science	2	20	10	44.5
Medicine	26	1896	73	29.9
Public Health	4	680	170	17.9
TOTAL	92	6777	-	-
AVERAGE	7	521	71	22.72

The 92 MOOCs are delivered through 2 types of modes, which are self-paced or instructor-paced learning. From table 3-5 can be concluded that MOOCs delivery mode (self-paced and instructor-paced) estimated participants' completion rates. Instructor-paced MOOCs participants were found to have significantly higher completion rates ($M = 25.4$, $SD = 31.6$) than self-paced MOOCs participants ($M = 17.3$, $SD = 29.9$), $t(5915) = 10.6$, $p < .001$, $M_{diff} = 8.10$, 95% CI [6.61, 9.59]. With a Cohen's d effect size of 0.263, this effect was small. The table below shows the MOOCs completion rate of each mode.

Table 4: Delivery mode descriptive

	Group	N	Mean	Median	SD	SE
Completion Rate	Self-paced	3938	17.3	0.00	29.9	0.477
	Instructor-led	2839	25.4	8.00	31.6	0.593

Table 5: Details of each faculty/program

Faculty	Delivery Mode	Number of Courses	Number of Participants	Average Completion Rate (%)
Mathematics & Natural Science	Self-paced	6	208	14.0
	Instructor-paced	4	101	23,7
Computer Science	Self-paced	9	882	8,78

Faculty	Delivery Mode	Number of Courses	Number of Participants	Average Completion Rate (%)
	Instructor-paced	5	368	10,9
Pharmacy	Self-paced	1	5	4,6
	Instructor-paced	n/a	n/a	n/a
Cultural Science	Self-paced	7	138	38,4
	Instructor-paced	2	188	13,9
Medical	Self-paced	7	1272	25,8
	Instructor-paced	19	624	38,1
Public Health	Self-paced	1	220	33
	Instructor-paced	3	460	10,7
Engineering	Self-paced	5	59	42,9
	Instructor-paced	2	446	25,8
Nursing Science	Self-paced	1	5	17
	Instructor-paced	1	15	53,6
Economic and Business	Self-paced	3	761	4,46
	Instructor-paced	2	473	40,1
Social and Political Science	Self-paced	4	68	32,3
	Instructor-paced	2	18	40,5
Psychology	Self-paced	n/a	n/a	n/a
	Instructor-paced	1	86	27,6
Administrative Science	Self-paced	1	49	33,7
	Instructor-paced	n/a	n/a	n/a
Vocational	Self-paced	5	271	7,92
	Instructor-paced	1	60	0,3

Table 6 Independent samples t-test

							95% Confidence Interval			
		Statistic	df	p	Mean difference	SE difference	Lower	Upper	Effect Size	
Completion Rate	Welch's t	-10.6	5915	< .001	-8.10	0.761	-9.59	-6.61	Cohen's d	-0.263

3.1.2 MOOC Review

Four MOOCs are selected for review based on several criteria, which are: (1) instructor-paced course with a high completion rate, (2) instructor-paced course with a low completion rate, (3) self-paced course with a high completion rate, and (4) self-paced course with low completion rate. Each course is reviewed based on the total number of participants, completion rate, delivery mode, course length, assessment type, and interaction type.

Table 7 Four MOOCs learning design

No.	MOOCs	Faculty	Number of participants	Completion rate	Delivery mode	Course length
1	Parallel Programming	Computer Science	267	15%	Instructor-paced	14 weeks
2	Plastic Surgery	Medical	257	61%	Instructor-paced	2 weeks
3	Hazard Risk Evaluation in the Workplace	Public Health	220	33%	Self-paced	16 weeks
4	Financial Accounting	Economic and Business	494	2%	Self-paced	12 weeks

We also conducted interviews with MOOCs instructors to get more information about the method of organizing their MOOCs. The questions include: (1) the learning design (evaluation, interaction, and scheduling), (2) the problem encountered and solutions, and (3) the suggestion for MOOC improvement. Unfortunately, only 3 instructors were successfully interviewed, while one more MOOC (Financial Accounting) didn't respond until the paper submission deadline. Here is the summary.

3.1.2.1 Learning Design

The parallel Programming course is delivered using the instructor-paced mode, in which synchronous meetings are held every four weeks from 8 am to 4 pm using the Zoom application. Several videos and written materials are displayed in the LMS one week before synchronous meetings. Of the 267 participants enrolled in the class, only about 40 people attended synchronous meetings. In addition to Zoom instructors also use Discord, a software that allows participants and instructors to interact, and highlight important things.

The instructor uses the discussion forum as an asynchronous form, where participants can discuss with each other, especially with them. The role of an assistant is also important as they are considered a technical troubleshooter and a course facilitator. The assessments used automatic scoring (auto-grading) in the form of Multiple-Choice Questions (MCQ). If someone succeeds in taking the quiz

with a high score, the instructor gives a reward in the form of Google Cloud credits worth 50 USD. The instructor also sent reminder emails to the participants to access materials, join the synchronous activities, and take quizzes.

Plastic Surgery MOOC was also delivered using instructor-paced mode. Synchronous sessions using Zoom are held as plastic surgery workshops with special mannequins. The workshop is carried out two consecutive days each week, with a daily duration of approximately 7 hours. Before conducting a synchronous session, the participants must first access the material on the MOOCs platform. Not only did they listen to the theory given by the instructor, but the participants also practiced during the workshop. When practicing, the camera must be pointed at the participant's desk, so that the process is monitored by the instructor. WhatsApp Groups are also used to establish communication with the participants. It is usually used for sharing, activity reminders, and workshop preparation. The assessments also used automatic scoring (auto-grading) in the form of Multiple-Choice Questions (MCQ).

Different from the two MOOCs before, Hazard Risk Evaluation in the Workplace is delivered using a self-paced mode, including assessments. However, the instructor also held a synchronous discussion session, which was conducted weekly using Zoom. Participants were asked to join in a breakout room to discuss with the main instructor and assistants about the assignments. Besides Zoom, the instructor also uses google Forms for the assessments.

3.1.2.2 MOOC Challenges

Several challenges were encountered during the learning process. First, not all participants complete the course as experienced in Parallel Programming and Plastic Surgery. In Parallel Programming, the participants are enthusiastic at the beginning of the week, but then it decreases. According to the instructor, it is due to the topic of MOOCs which is quite difficult. In Plastic Surgery, participants tend to be more active when synchronous sessions, rather than the asynchronous activities and discussion forums in MOOCs platform. Because this is a practical course, participants are more enthusiastic when they witness and practice the content directly, so they can immediately know the right or wrong way to do plastic surgery.

Another problem is more technical, such as those faced by Hazard Risk Evaluation in the Workplace. First, they didn't have adequate facilities to make MOOC videos. Second, they didn't yet fully understand how to operate the MOOCs platform, especially in terms of creating interactive materials and monitoring the participant's activities during the learning process.

3.1.2.3 MOOC Improvement

All of the MOOCs instructors gave some suggestions for improving MOOCs, including: (1) increasing assistance to promote MOOCs to gain more participants, (2) lecturers must improve skills to produce learning videos and interactive materials in MOOCs platform, and (3) issuing a statement of participant's commitment to complete the MOOCs.

4 discussion and limitations

4.1 UI MOOCs Overview

Based on the findings, we conclude that the faculty of medicine, engineering, and computer science are the top three MOOCs producers in UI. The faculty of medicine also contributes the highest participants, along with computer sciences and economic and business faculty. This finding is in line with the best online course of all time by Class Central, which listed MOOCs from the technology, personal development, health & medicine, humanities, and business categories as the top 5 MOOCs available in 2022 (Shah, 2022). Despite a total of 6.777 MOOCs participants, with an average of 521 participants, some of the MOOCs are only attended by participants ranging from 5-247 participants. MOOCs from economic and business faculty attract the most participants and MOOCs from pharmacy attract the least participants. In 2017, edX alone had 2.4 million unique participants, 245.000 certificates issued, and an average of 1.554 new participants enrolled per day (Office of Digital Learning, 2017). More study needs to be done to gain insight into UI MOOCs participation, whether the low participation is caused by an unattractive topic, ineffective marketing, or other factors.

Most UI MOOCs are delivered using self-paced mode with the participant's completion rate at an average of 17.3%. This completion rate is significantly different from the instructor-paced MOOCs (M=25.4%), although the effect is small. The results fit our assumption, which is self-paced MOOCs

completion rate is lower than the instructor pace. Despite its lower than instructor pace completion rate, the number is bigger than the average completion rate of edX participants from the 2017-2018 cohort (M=3.13%) and 2013-2018 cohort (M=4.42%) (Reich & Ruipérez-Valiente, 2019).

Despite the results, some of the instructor-paced MOOCs are also low on completion rate. One of the instructors (Parallel Programming course) reported exercising different and innovative strategies to increase participation, yet it still gains a low completion rate. In addition, Plastic Surgery MOOCs, which is a two-week instructor-paced course, recorded a 61% completion rate. More study on completion rate from the participant's perspective is needed, to gain more insight into possible factors that might contribute to the completion rate.

Although most UI MOOCs are being delivered using the self-paced mode, findings from interviews suggest that it's not truly self-paced. Most MOOCs still have a fixed start date and assignment or quiz deadlines. In addition, one of the self-paced MOOCs we interviewed also held a synchronous video conferencing session. These might suggest that UI had a different mode of MOOCs delivery. Due to their credit-bearing and practical nature, UI MOOCs might have been effective and efficient if delivered in hybrid mode.

4.2 The Factor of Participation Success

Based on the interview results with the 3 MOOCs instructors above, some interesting things were found. First, the two MOOCs, Parallel Programming and Plastic Surgery, have different completion rates, whereas parallel programming has a lower completion rate (15%) than Plastic Surgery (61%). Both MOOCs use the instructor-pace mode and regularly meet at synchronous sessions and discussion forums. They also use the auto-grading model for all assessments. We suspect the difference is caused by (1) content difficulty for participants, which was reported by the Parallel Programming instructor, even though the learning design is modified to accommodate the problem, 2) the course length of Plastic Surgery is shorter than Parallel Programming, which is consistent with Jordan (2015) which states longer courses having lower completion rates, and (3) Plastic surgery course is most likely the MOOCs that are needed by participants in the health sector and offer rewards in the form of credit points that can be directly recognized for education and career advancement purposes.

Referring to table 6, both Hazard Risk Evaluation in the Workplace and Financial Accounting courses used self-paced mode, yet Hazard Risk Evaluation in the Workplace had a completion rate higher than Financial Accounting. After reviewing the class content and conducting interviews, we found that Hazard Risk Evaluation in the Workplace did not fully use the self-paced mode. There were several synchronous meetings to strengthen learning materials, which we assume contributes to a higher completion rate. This phenomenon suggests that not all MOOCs instructors fully understand the application of self-paced mode in MOOCs.

Different from the Financial Accounting course, which only relies on discussion forums without any synchronous meetings. However, that forum is not available in every session or learning topic, and only a few participate. Moreover, the instructor is not present at the discussion. Unfortunately, we could not get the interview results from the Financial Accounting course, to add more insight into this.

Based on the results above, it can be concluded that the main factor that might contribute to the success of UI MOOCs participants is the presence and feedback from the lecturer or instructor, both instructor-paced and self-paced mode. This is in line with the research results that state teacher and facilitator presence feedback and interaction will affect the completion rate (Hone & El Said, 2016; Goh, Ayub, Wong, & Lim, 2017). The presence of instructors at synchronous sessions and discussion forums on the three MOOCs contributes to the participant's persistence in the learning process.

4.3 Limitations

This study has several limitations. The first limitation, this study only involves data from MOOCs platforms, UI MOOCs reports, and interview data from MOOCs instructors. Not all evaluation forms in each course are filled in by the participants, therefore we do not have the participants' perspectives on MOOCs. The next study needs to involve MOOCs participants to give more insight into UI MOOCs practices. The second limitation, only 4 MOOCs instructors were interviewed due to time constraints, which might affect the richness of the qualitative data. The next study needs to involve more instructors to give their opinion on MOOCs implementation. The last limitation, we do not have complete data, on whether the MOOCs offered are free or fee-based. We suspect that the completion rate will improve along with participants' commitment to the program, just like edX learners who

pay for a verified track (Reich & Ruipérez-Valiente, 2019). More study in this aspect is needed, especially when UI MOOCs had payable fees.

5 CONCLUSION

From UI MOOCs implementation, several conclusions can be made. First conclusion, economic and business topics are the most attractive (1234 total participants, with a 247 average) compared to other topics, with the faculty of medicine as the most productive MOOC creator (N=26). The second conclusion, the highest completion rate is from nursing MOOCs (M=44.5%), with 20 participants, and the lowest is from pharmacy MOOCs (M=4.60%) with 5 participants, and an average of 22.72%. This average is higher than the completion rate from all edX participants (M=4.42%) from the 2014-2018 cohort. The third conclusion, most of the UI MOOCs are delivered through a self-paced mode, and the completion rate (M=17.3%) is significantly lower than the instructor pace MOOCs (M=25.4%). Although mainly delivered through self-paced mode, we suspect that not all MOOCs are truly self-paced. Most MOOCs still have a fixed start date and assignment or quiz deadlines. In addition, one of the self-paced MOOCs we interviewed also held a synchronous video conferencing session. Forth conclusion, UI MOOCs encounter some challenges, such as completion rates, and instructor difficulties in creating video content and using the MOOC platform. The last conclusion, the main factor that might contribute to the success of UI MOOCs participants is the presence and feedback from the lecturer or instructor, both instructor-paced and self-paced mode.

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