

# The role of self-regulated learning Strategies on learners' Satisfaction in Massive Open Online Course (MOOC): Evidence from Malaysia

## MOOC

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**Abstract:** Learning in Massive Open Online Courses (MOOCs) necessitates learners to be capable of self-regulating their learning in order to oversee and adapt their behaviour and actions in certain learning settings. Studies have highlighted that learners who have good control of self-regulation in their learning, either formal or informal learning contexts, utilise more competent learning strategies in online learning context. Nevertheless, MOOCs attract a diverse range of learners, each with different experience and satisfaction. The aim of this study is to examine the role of self-regulated learning (SRL) and its components (time management, planning, self-evaluation, and help-seeking) on learners' satisfaction in MOOC. Data were collected from 281 learners of a Malaysia MOOC namely *Asas Keusahawanan (Introduction to Entrepreneurship)*, in the second semester of the Malaysian universities academic calendar. A cross-sectional web-based survey was applied and a Partial Least Square (PLS) approach was used for analysing data. Findings indicated that all of SRL components except help-seeking are important factors for explaining learners' satisfaction in a MOOC. This study provides useful suggestions for the course designers of MOOCs platforms, and the facilitators in engaging learners with suitable SRL strategies and increase the level of course satisfaction.

**Index Terms:** Massive Open Online Course (MOOC), Malaysia MOOC, Satisfaction, Self-regulated learning.

## I. INTRODUCTION

Massive Open Online Courses (MOOCs) have of been much interest around the world and attract more audiences compared to traditional online education and no fees are required to participate in the courses which cater to all types of learners [1]. Coursera, Udacity, and edX are examples of MOOC providers that rapidly expanding by providing online courses. The rapid growth of MOOCs can be seen in 2018 as there were almost 81 million learners in 9,400 MOOCs developed by more than 800 higher learning institutions [2]. It is expected that the numbers of both MOOCs learners and the institutions offering MOOCs will continue to increase. Consequently, Malaysia have made the efforts to set up Malaysia MOOC in making distance education be meaningful [3] and reachable for all learners [4].

Currently, Malaysia MOOC is operated under

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OpenLearning Global (M) Sdn. Bhd. *OpenLearning* has become the official MOOC platform for all 20 public universities and 34 public polytechnics in Malaysia. From 2014, over 3,050 academics and 900,000 students across Malaysia have used the *OpenLearning* platform to deliver over 880 courses through the Malaysia MOOC initiative. With this hype and a huge number of enrollments, MOOCs are regarded as a platform for self-learning through this open education resources. Learners in MOOCs are assumed to be responsible for and control their learning whereas the instructors usually facilitate the learning activities in traditional face-to-face classrooms [5]. Consequently, without the help and direction from a facilitator, the capacity to manage one's learning procedure is an essential ability to ensure the attainment of learning outcomes. Earlier work found that numerous learners experience difficulties self-regulating in web-based learning conditions [6]. With regards to MOOCs, which provides minimal supervision and support, the external pressure to improve and the issue of learners' outcome measure of satisfaction in MOOC requires that learners be highly self-directed to attain their learning outcomes [7]-[9]. This sparks the interest to investigate how learners' self-regulation strategies may support their satisfaction in learning environments like MOOCs.

## II. LITERATURE REVIEW

Self-regulation is the process that learners possess and execute key skills to plan and organize learning activities in their learning environment, schedule study time, seek help when needed, and monitor whether learning goals were achieved [10]-[11]. Among its sub-components, planning is considered as the key constituent skill for self-regulation [12] and it refers to one's decision making on how to accomplish a learning task by setting goals, environments structuring, and identifying the learning strategies to achieve set goals [13]. Reference [14] observed that undergraduate students effectively finish their learning activities and are content with the final results when they plan their learning systematically. Similarly, [5] found that planning and goal setting are important strategies for learners in MOOCs which predicted fulfilment of personal course goals. Thus, the following hypothesis is presented:



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**H<sub>1</sub>.** Planning has a positive and significant relationship with learners' satisfaction.

Time management, another important component of self-regulation, refers to allocating the time effectively to complete course activities on time [11]. Time management is considered as one of the top challenges that students face in online courses with more than seventy percent of graduate students indicated that time management is one of the critical factors for their achievement in an online course [15]. Similarly, [16] indicated that time management significantly impacts student achievement and satisfaction in an online certification program. Consequently, the following hypothesis is postulated:

**H<sub>2</sub>.** Time management has a positive and significant relationship with learners' satisfaction.

The next component, help-seeking, is a social component of self-regulation and is defined as one getting assistance from others (e.g., instructor, peers, and parents) to complete a specific course related task [11]-[12]. Reference [14] found that help-seeking is one of the key strategies that promote successful students' adaptation to online learning environments. Moreover, in MOOC's learning context, [17] found that help-seeking is important component to regulate students' learning and enhance their motivational beliefs. Consequently, the following hypothesis is postulated:

**H<sub>3</sub>.** Help-seeking has a positive and significant relationship with learners' satisfaction.

Self-evaluation is another critical component of self-regulation that refers to learners' skills in monitoring their performance and continuously evaluating their learning progress. Reference [18] proposed that providing opportunities for learners to self-evaluate their progress and performance (e.g. asking to self-evaluate assignments) helps them to identify learning deficiencies and improve learning outcomes. Examining data collected from over 200 graduate and post-baccalaureate students, [10] found that self-evaluation mediates learners' overall achievement in an online course. Thus, the following hypothesis is postulated:

**H<sub>4</sub>.** Self-evaluation has a positive and significant relationship with learners' satisfaction.

## III. METHOD

### A. Participants

In this study, participants in a MOOC of the Universiti Utara Malaysia (UUM), namely, *Asas Keusahawanan* (Introduction of Entrepreneurship) were studied. The MOOC was designed on *Openlearning* platform and exposed to the learners the basics of entrepreneurship in terms of history, concepts, self-development, skills and behavior. For this study, a participant is referred to as an individual who enrolled to the MOOC and has joined in at least one activity in the course. Of 1358 participants who enrolled to the course in the second semester of 2018/2019 session of the Malaysian universities academic calendar, 281 (20.7%) participants responded to the online questionnaire. The number of female participants 231 (82.2%) was greater than the number of male 50 (17.8%) participants, and the participants' ages ranged from 19 to 35 years old. Majority of the participants are undergraduates' students (98.6%) from UUM whereby they enrolled for this MOOC as part of their course requirement.

Approximately, half of the participants 119 (42.3%) accessing for this MOOC several time per week while 172 (61.2%) participants have experience learning in MOOCs.

### B. Instrumentation

The Online Self-regulated Learning Questionnaire [10] and E-learner Satisfaction Survey [19] were adapted to assess self-regulation and learner satisfaction in MOOC. The English version of the instruments were translated into Malay by utilizing back translation procedure [20]. Prior to conducting the back-translation, three Malay-English experts, who are also the native speakers of Malay, from Malaysian Institute of Translation & Books (ITBM) and a Malaysian public university were asked to do the translation. The translation began with a bilingual translator translated the questionnaire from English (source language) into Malay (the target language). Then, another bilingual translator blindly back-translated the Malay version questionnaire into English in order to test the equivalence between the original and translated questionnaire. Further, another expert in the field who is bilingual was consulted for the precision and accuracy of the back translation. After the accuracy of the translation is certain, the finalized Malay version of the instruments were administered to the learners at the end of the course. Reliability and factor analyses confirmed that the instruments are reliable and valid measure of learners' self-regulation and satisfaction in MOOC. The final self-regulation questionnaire comprised of four constructs (e.g., help-seeking, planning, self-evaluation, and time management) with 20-items and the satisfaction survey entailed of one construct with 7 items. For both instruments, participants rated their agreement to the given statements according to a 7-point Likert scale, ranging from strongly disagree to strongly agree.

### C. Data analysis

This study employed Partial Least Squares (PLS) structural equation model to investigate the influence of self-regulated learning strategies on learners' satisfaction in MOOC. The 2-step analytical procedure suggested by [21] was adhered in this study. The two steps outline that the measurement model must be assessed first before the structural model. The measurement model defines the measurements of constructs while the structural model characterises the relationships among the constructs in the structural model [22]. PLS was employed to evaluate the structural and measurement models as this method is capable of testing multiple relationship simultaneously, in turn, providing more precise findings [23].

## IV. RESULTS

### A. Assessment of measurement model

Convergent validity assesses the degree to which the items of a construct are correlated. Reference [21] recommend that a composite reliability (CR) of 0.70 or above and an average variance extracted (AVE) of more than 0.50 are considered acceptable in establishing convergent validity.

Table 1 depicts that the value of every CR is between 0.872 and 0.968, which surpasses 0.70. The value for every AVE is between 0.695 and 0.846, surpassing the recommended threshold of 0.50. Hence, all constructs are deemed to have fulfilled convergent validity as illustrated in Table 1.

Table 1. Results of the measurement assessment.

First-order construct	Second-order construct	Item	Factor Loading	CR	AVE
Goal Setting (GS)	Planning (P)	GS1	0.901	0.948	0.819
		GS2	0.888		
		GS3	0.921		
		GS4	0.909		
Environment Structuring (ES)		ES5	0.907	0.943	0.846
		ES6	0.921		
		ES7	0.931		
Task Strategies (TS)		TS8	0.852	0.910	0.718
		TS9	0.759		
		TS10	0.836		
		TS11	0.887		
Time Management (TM)	GS	0.953	0.938	0.836	
	ES	0.901			
	TS	0.887			
	Help-Seeking (HS)	TM12	0.837	0.904	0.758
TM13		0.885			
TM14		0.889			
Self-Evaluation (SE)	HS15	0.878	0.872	0.695	
	HS16	0.776			
	HS17	0.844			
Learner Satisfaction (LS)	SE18	0.913	0.926	0.807	
	SE19	0.879			
	SE20	0.902			
Learner Satisfaction (LS)	LS1	0.903	0.968	0.811	
	LS2	0.921			
	LS3	0.901			
	LS4	0.915			
	LS5	0.878			
	LS6	0.920			
	LS7	0.866			

Discriminant validity is also evaluated. This validity aims to ensure that the measurement model of a construct does not contain redundant items. Employing Fornell-Larcker criterion [24] enables discriminant validity to be assessed. As observed in Table 2, the square roots of the AVEs upon the diagonals (in bold) were identified to be larger than the values for the correlations among constructs (respective rows and columns). As per the recommendations by [22], an accepted discriminant validity is established. Furthermore, the exogenous constructs have a correlation of less than 0.85 [25]. Consequently, the discriminant validity for all constructs in the measurement model is fulfilled satisfactorily.

Table 2. Fornell-Larcker criterion of discriminant validity.

Construct	Planning	Time Management	Help-Seeking	Self-Evaluation	Learner Satisfaction
Planning	<b>0.914</b>				
Time Management	0.790	<b>0.871</b>			
Help-Seeking	0.763	0.743	<b>0.834</b>		
Self-Evaluation	0.835	0.770	0.829	<b>0.898</b>	
Learner Satisfaction	0.829	0.719	0.690	0.788	<b>0.901</b>

**B. Assessment of structural model**

Computations of beta ( $\beta$ ),  $R^2$ , and respective  $t$ -values using the bootstrapping technique with a resampling of 5000 were employed to test the structural model [22]. Table 3 and Fig. 1 present structural modelling calculations that demonstrate the findings of the hypotheses' tests where each hypothesis is tested. Planning meaningfully predicts learners' satisfaction, hence,  $H_1$  is acceptable ( $\beta=0.528$ ,  $t=7.921$ ,  $p < 0.05$ ). Time management marginally predicts learners' satisfaction with ( $\beta=0.093$ ,  $t=1.789$ ,  $p < 0.05$ ), while help-seeking was not a significant predictor of learners' satisfaction in MOOC with ( $\beta=-0.032$ ,  $t=-0.538$ ,  $p > 0.05$ ), and hence,  $H_2$  is acceptable but  $H_3$  is not acceptable respectively. The role of self-evaluation also meaningfully predicts learners' satisfaction, thus,  $H_4$  is confirmed ( $\beta=0.302$ ,  $t=4.369$ ,  $p < 0.05$ ). Overall, the self-regulation strategies applied in this study explain 72.1% of learner's satisfaction in MOOC.

Table 3. Results of the structural assessment.

Hypothesis	Relationship	Std. Beta	t-value	p-value	Decision
$H_1$	Planning -> Learners' Satisfaction	0.528	7.921	0.000	Supported
$H_2$	Time Management -> Learners' Satisfaction	0.093	1.789	0.037	Supported
$H_3$	Help-Seeking -> Learners' Satisfaction	-0.032	0.538	0.295	Not Supported
$H_4$	Self-Evaluation -> Learners' Satisfaction	0.302	4.369	0.000	Supported

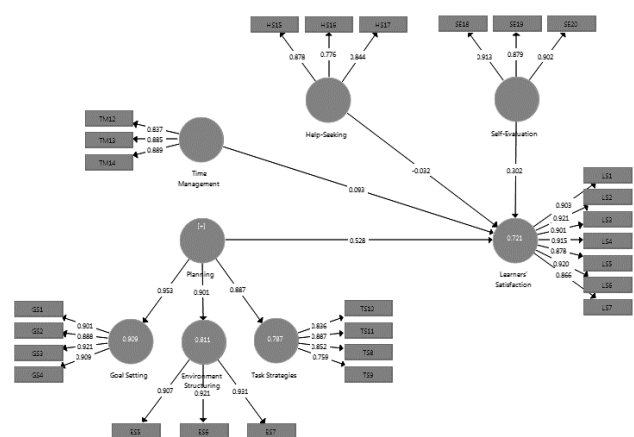


Figure 1. Structural model of self-regulated learning strategies on learners' satisfaction.



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## V. DISCUSSION

The importance of self-regulation strategies on learners' satisfaction in MOOC is examined in this research. Four components were investigated in this study which are time management, planning, self-evaluation, and help-seeking and this study identified that planning is concluded as the most critical strategy in examining learners' satisfaction in a MOOC. This finding pinpoints the significance of planning and its elements (task strategies, environment structuring, and goal setting) as a self-regulation strategy [12] and is in accordance with findings from prior empirical studies [5], [14]. In their case study with six graduate students, [14] found planning as one of the important factors in influencing satisfaction. Similarly, in another study by [5] with 4831 learners in 6 MOOCs, the findings showed that learners who were stronger in planning and SRL skills outperformed their counterparts who were not good at planning in MOOC.

Time management is the second component of self-regulation examined in this research. The values show a significant influence of time management on learners' satisfaction. This finding is supported by some studies that found time management having a significant influence on learning factors [15]-[16]. For instance, [15] reported time management is a critical factor in influencing student achievement in online learning after surveying with 76 graduate learners. Similarly, in their study with 80 students taking an online computer programming course, [16] found that time management is an important skill needed for successful and satisfactory online learning experiences.

Help-seeking was not found as a significant self-regulated learning strategy influencing learners' satisfaction in MOOC. This finding is startling as previous literature has discovered that students who revealed that collaborating with others such as friends throughout the course demonstrated improved performance [17], [26]. However, this finding is aligned with recent study by [5] that showed help-seeking is not a significant factor affecting learners' goal attainment in the MOOCs learning context. One possible explanation of this phenomena is based on the norms about help-seeking vary across cultural contexts, which is more likely visible in collectivist contexts [27]. Therefore, considering different learning context in MOOCs learning environment (for example in Malaysia MOOC context in this study) is imperative in encouraging effective scaffolding for help-seeking [5]. The last component of self-regulation investigated in the study was self-evaluation. Self-evaluation was found to be a significant factor for explaining learners' satisfaction in MOOC. This finding consistent with the previous studies suggesting self-evaluation as an important skill to have in order to be more satisfied in online learning environments [10], [14], [18]. For example, [10] reported that self-evaluation is one of the self-regulated learning strategies that mediate learners' overall achievement in online learning. Similarly, [14] reported self-evaluation as one of the important self-regulation components that is mostly adapted by successful online learners.

## VI. CONCLUSION

In this study, we found that planning, time management and self-evaluation are significant factors influencing

learners' satisfaction in a Malaysia MOOC. The results from this study highlight the criticality of learners' ability to plan and setting their objective to self-regulate their learning in MOOC. It is also vital for them to manage their time wisely when learning, simultaneously offering learners with the instrument to assess their progress and accomplishments throughout the course in order to increase their satisfaction level. Developers, learning designers, course creators and educators are not only urged to create high-quality learning content, yet in addition help MOOC learners to make detailed planning, establish their objectives and learning time, and to assess the possible advantages of the course.

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## REFERENCES

1. B. Voss, "Massive open online courses (MOOCs): A Primer for University and College Board Members," *Association of Governing Boards of Universities and Colleges [White Paper]*, 2013. Available: [agb.org/sites/agb.org/files/report\\_2013\\_MOOCs.pdf](http://agb.org/sites/agb.org/files/report_2013_MOOCs.pdf).
2. D. Shah, "By the numbers: MOOCs in 2017," 2018. Available: <https://www.class-central.com/report/mooc-stats-2017/>
3. M. F. M. Yaakob, and M. M. M. Zalli, "An Overview of Massive Open Online Courses (MOOCs), Pedagogies, and Distance Education," in *Redesigning Higher Education Initiatives for Industry 4.0*: IGI Global, 2019, pp. 56-68.
4. N. Rubaai, and H. Hashim, "Polytechnic ESL lecturers' acceptance of using Massive Open Online Course (MOOC) for teaching English as a Second Language (ESL)," *International Journal of Innovative Technology and Exploring Engineering*, vol. 8(9), 2019, pp. 114-121.
5. R. F. Kizilcec, M. Perez-Sanagustin, and J. J. Maldonado, "Self-regulated learning strategies predict learner behavior and goal attainment in massive open online courses," *Computers and Education*, vol. 104, 2017, pp. 18-33.
6. S. Lajoie, and R. Azevedo, "Teaching and learning in technology-rich environments," *Handbook of Educational Psychology*, vol. 2, 2006, pp. 803-821.
7. K. F. Hew, and W. S. Cheung, "Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges," *Educational Research Review*, vol. 12, 2014, pp. 45-58.
8. R. F. Kizilcec, and S. Halawa, "Attrition and achievement gaps in online learning," in *Proceedings of the Second ACM Conference on Learning@Scale*, 2015, pp. 57-66.
9. E. Rabin, Y. M. Kalman, and M. Kalz, "An empirical investigation of the antecedents of learner-centered outcome measures in MOOCs," *International Journal of Educational Technology in Higher Education*, vol. 16(1), 2019, pp. 14.
10. L. Barnard, V. Paton, and W. Lan, "Online self-regulatory learning behaviors as a mediator in the relationship between online course perceptions with achievement," *International Review of Research in Open and Distance Learning*, vol. 9(2), 2008, pp. 1-15.
11. N. Dabbagh, and A. Kitsantas, "Supporting self-regulation in student-centered web-based learning environments," *International Journal on E-Learning*, vol. 3(1), 2004, pp. 40-47.
12. B. J. Zimmerman, "Attaining self-regulation: A social cognitive perspective," in *Handbook of self-regulation*: Academic Press, 2000, pp. 13-39.
13. A. Kitsantas, and B. J. Zimmerman, "Comparing self-regulatory processes among novice, non-expert, and expert volleyball players: A microanalytic study," *Journal of Applied Sport Psychology*, vol. 14(2), 2002, pp. 91-105.
14. J. L. Whipp, and S. Chiarelli, "Self-regulation in a Web-based course: A case study," *Educational Technology Research and Development*, vol. 52(4), 2004, pp. 5-22.

15. L. Song, E. S. Singleton, J. R. Hill, and M. H. Koh, "Improving online learning: Student perceptions of useful and challenging characteristics," *The Internet and Higher Education*, vol. 7(1), 2004, pp. 59-70.
16. E. Yukselturk, and S. Bulut, "Predictors for student success in an online course," *Educational Technology and Society*, vol. 10(2), 2007, pp. 71-83.
17. R. F. Kizilcec, and E. Schneider, "Motivation as a lens to understand online learners: Toward data-driven design with the OLEI Scale," *Transactions on Computer-Human Interactions*, vol. 22(2), 2015, pp. 24.
18. K. Ley, and D. B. Young, "Instructional principles for self-regulation," *Educational Technology Research and Development*, vol. 49(2), 2001, pp. 93-103.
19. P. C. Sun, R. J. Tsai, G. Finger, Y. Y. Chen, and D. Yeh, "What drives a successful elearning? An empirical investigation of the critical factors influencing learner satisfaction," *Computers and Education*, vol. 50(4), 2008, pp. 1183-1202.
20. R. W. Brislin, "Back-translation for cross-cultural research," *Journal of Cross-cultural Psychology*, vol. 1, 1970, pp. 185-216.
21. J. F. Hair, W. C. Black, B. J. Babin, and R. E. Anderson, *Multivariate Data Analysis: A Global Perspective (7th edition)*. Upper Saddle River, New Jersey: Pearson Education Inc., 2010.
22. J. F. Hair, G. T. M. Hult, C. Ringle, and M. Sarstedt, *A primer on partial least squares structural equation modeling (PLS-SEM) (2nd ed.)*. London: Thousand Oaks: SAGE, 2017.
23. D. W. Barclay, C. Higgins, and R. Thompson, "The partial least square (PLS) approach to causal modeling: Personal computer adoption and use as an illustration," *Technology Studies*, vol. 2(2), 1995, pp.285-309.
24. C. Fornell, and D. F. Larcker, "Evaluating structural equation models with unobservable variables and measurement error," *Journal of Marketing Research*, vol. 18(1), 1981, pp. 39-50.
25. Z. Awang, *SEM Made Simple: A Gentle Approach to Learning Structural Equation Modelling*. Bandar Baru Bangi: MPWS Rich Resources, 2015.
26. L. Breslow, D. E. Pritchard, J. DeBoer, G. Stump, A. D. Ho, and D. Seaton, "Studying learning in the worldwide classroom: Research into edX's first MOOC," *Research and Practice in Assessment*, vol. 8, 2013, pp. 13-25.
27. A. Ogan, E. Walker, R. Baker, M. M. T. Rodrigo, J. C. Soriano, and M. J. Castro, "Towards understanding how to assess help-seeking behavior across cultures," *International Journal of Artificial Intelligence in Education*, vol. 25(2), 2015, pp. 229-248.

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