



Self-regulation and Learning Outputs of Filipino MOOC Learners

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Abstract. During the coronavirus pandemic, scholars study how learners pursue lifelong learning in open and distance education since few studies investigate this issue. This study aims to discover a learning model that would increase the students' online learning engagement and course completion in Massive Open Online Courses (MOOCs). Adopting the Self-Regulation Theory (SRT) on andragogy, this study is administered to 290 Massive MOOC adult learners in the Davao region. The author aimed to identify the respondents' level of self-regulation in online learning, determine their learning outputs in a MOOC, examine the relationship between their self-regulation and learning outputs, and ascertain the significant predictors of their learning outputs. This study applied a quantitative-correlational design in collecting, interpreting, and discussing data from surveys using an adapted questionnaire. The author treated the data through a multiple regression correlation test. The results reveal that the respondents' level of self-regulation in MOOC was very high, and they attained an excellent level of learning outputs. Furthermore, the findings show a strong relationship between their self-regulation and learning outputs in MOOCs. Meta-cognition, time management, environmental structuring, help-seeking, and persistence were significant predictors of learning outputs as reflected in the learning model that emerged. Findings also highlighted that self-regulation could significantly predict the learning outputs of online learners in exploring the MOOCs for their personal and professional development.

Keywords: self-regulation · MOOC · self-regulated learning · self-regulation theory · learning output

1 Introduction

Exploring the Massive Open Online Courses (MOOCs) opens opportunities for individuals to learn anything anytime. This learning modality responds to non-formal and distance education, whereby people learn by exploring online educational resources through internet websites, social media, and online courses. Although some educational sectors recognize MOOCs as a promising platform for media and computer literacies, certain studies also highlight their setbacks aside from the learners' benefits.

Some countries investigated the individuals' behaviors and experiences in learning the MOOCs. Students in Turkey viewed MOOCs positively, with their modality playing significant roles in cultivating an inclusive education [1]. MOOCs were also inspiring many enrollees in Pakistan amid a few barriers to the surge of e-learning [2]. In addition, faculty members in Jordan consider MOOC a great advantage because it provides them with better learning opportunities [3]. The idea and adoption of MOOCs were also emerging in India and China [4]. In China alone, Yang [5] encouraged the educational leaders to advance supporting services in promoting the development of MOOCs. However, instructors in Indonesia and Malaysia encountered significant challenges in designing a MOOC, such as participant engagement, video development, collaboration encouragement, and time constraint [6].

Although some studies convey how self-regulation correlates to an individual's MOOC performance or achievement, only a few studies focus on the self-regulation of professional learners and their MOOC grades or learning outputs. Further research is needed about adults' self-regulation in online learning and informal course outputs [7]. The authors respond to this gap by investigating the self-regulation of 290 MOOC learners who were in-service teachers in Davao del Norte and by determining the relationship of their self-regulation to the learning outputs they achieved in MOOCs. Reviewing all the issues and findings related to self-regulation and MOOCs, the researchers consider it critical in conducting this research. This study is essential to critically examine the role of self-regulation in maximizing the learners' success in online studies and strengthening the thriving MOOC camps in the Davao region. Statement of the Problem.

This study investigates whether there is a correlation between self-regulation and the learning outputs of the Davao del Norte MOOC learners as the basis for their success in accomplishing online courses. Particularly, this study seeks to answer the following research questions: (1) What is the level of self-regulation of the Davao del Norte MOOC learners in terms of metacognition; Time management, Environmental structuring, Help-seeking, and Persistence? (2) What level of learning outputs are achieved by Davao del Norte MOOC learners? (3) Is there a significant relationship between the self-regulation and the learning outputs of the Davao del Norte MOOC learners? (4) Which indicators of self-regulation are significant predictors of MOOC learning outputs?

2 Research Methods

In this study, the researchers employed a quantitative-correlational approach. The researchers also used correlations to see if a relationship exists; the variables themselves are not under the researcher's control. In this study, the author tested if the online self-regulation of Davao del Norte MOOC learners correlates to their learning outputs.

The researcher modified the Self-Regulated Online Learning Questionnaire (SOL-Q) of Jansen et al. [8] to make it a tailored fit to the relevant literature. Jansen et al. [8] applied Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) to other four common SRT models, which resulted in the five core indicators of self-regulation in the SOL-Q, namely: (1) Metacognition, (2) Time management, (3) Environmental structuring, (4) Help-seeking; and (5) Persistence. Consequently, the SOL-Q scores from these five self-regulation indicators served as the independent variables of this

study. After the experts validated the independent variables, the instrument underwent the validity and reliability tests via Cronbach Alpha to ensure the objectivity in acquiring the needed data. After conducting the tests on 30 non-participant online learners, it resulted in a Cronbach's Alpha of 0.931 or 93.10%, which means that the survey questionnaire is excellent for use [9].

The respondents of this study were the in-service basic education teachers who accomplished the MOOC on Teaching English for Young Learners sponsored by the US Department of State. Furthermore, they were bona fide residents of any municipality or city within the province of Davao del Norte and voluntarily affiliated with any functional MOOC camps. The respondents came from the four (4) municipalities and two (2) cities in the said province, namely Asuncion, Kapalong, Carmen, St. Tomas, Tagum City, and Panabo City. The researcher requested the participation of the qualified respondents from these areas in completing the enumeration of 290 professional teachers based on the database of the MOOC director to ensure the utmost objectivity of the data.

The collected data were analyzed through a multiple regression test since this study sought to determine whether there is a significant relationship between its dependent and independent variables. In this study, multiple regression analysis was preferable to further analyze the predictions between its independent and dependent variables.

3 Results and Discussion

3.1 Level of Self-regulation of Davao del Norte MOOC Learners

Table 1 exhibits the level of self-regulation across its indicators achieved by the MOOC learners of the Davao del Norte Camp. They manifested this self-regulation in their open and distance education through MOOCs.

3.2 In Metacognition

A very high level of metacognition implies that the MOOC learners are aware of the various metacognitive practices to maximize their e-learning in a virtual space. Aside from that, the result also suggests that these learners have usually applied goal-setting, strategic thinking, problem-solving, and group collaboration in completing online courses.

Table 1. Level of Self-Regulation of the Davao del Norte MOOC Learners

Personal Self-Regulation	n	Mean Score	SD	Description
Metacognition	290	8.624	1.176	Very High
Time Management	290	8.481	1.195	Very High
Environmental Structuring	290	8.574	1.192	Very High
Help Seeking	290	8.610	1.269	Very High
Persistence	290	8.690	1.058	Very High
Overall	290	8.596	1.050	Very High

Having achieved such a level reflects that they are motivated, goal-oriented, and self-directed in pursuing professional studies for their growth and development. Therefore, a very high level of self-regulation in terms of metacognition is a desirable outcome. This confirms that the respondents are active learners, effective leaders, and pro-development professionals in the educational context.

3.3 In-Time Management

These findings imply that these MOOC learners with a high level of time management know how to set priorities, prepare realistic schedules, and avoid wasting time. Moreover, they value their time as an essential resource to balance their personal and professional life as they aim for career advancement given their hectic schedules. They are also conscious of budgeting time to perform work-related matters, learning the MOOC instructional videos, and working out the assessment tasks to complete online courses. Lastly, a very high level of self-regulation in terms of time management is a good result. This means that the respondents are learning flexibly, well-disciplined, and goal-directed learners in the educational setting.

3.4 In Environmental Structuring

A very high level of environmental structuring is a favorable finding. This suggests that the respondents know the importance of preparing the needed educational resources, learning facilities, and conducive-to-learning area to optimize their learning experience in online courses. They understand that adequate learning materials and ideal learning spaces contribute to effective learning. Finally, the data also indicate that they seek the desirable learning conditions and moods when browsing for the learning tasks. In brief, they prefer to study in a conducive-to-learning physical and virtual environment.

3.5 In Help-Seeking

Having a very high level of help-seeking signifies that the respondents are conscious of when to ask for help and extend help to one another when concerns, challenges, and difficulties related to online learning arise.

They acknowledge that exploring the information superhighway is not smooth, which may evaluate one's determination to accomplish a course. These learners collaborate and synergize as one camp, strengthening their support systems and lifelines to succeed. Hence, a very high level of self-regulation in terms of help-seeking is a noble finding. This highlights that the MOOC learners are willing to perform collaborative support and problem-solving should the occasion occur.

3.6 In Persistence

A very high level of persistence reveals that the respondents are strong-willed and determined learners in navigating the MOOCs for professional development. They never easily give up when different problems prevail nor back down when their journey gets

tough. Aside from that, they are empowered by professionals that can conquer learning struggles. Thus, a very high level of self-regulation in terms of persistence is a pleasant result. This proves that MOOC learners are prepared to overcome obstacles and hit for success in their online studies.

In Table 1, the overall level of self-regulation achieved by the Davao del Norte MOOC learners is very high, with a mean score of 8.596 on a 10-point scale. Its standard deviation is 1.058, implying that the spread of most scores within a set of data is close to the mean. This data behaves consistently with the mean scores of each self-regulation indicator.

Zimmerman & Schunk [10] argued that the higher the level of a learner's self-regulation, the more he/she can focus on the learning process, thus, exerting a positive effect on learning achievement. In addition, Nami et al. [11] reported that the people's learning approaches significantly correlated with the self-regulation factors: self-evaluation, memory strategy, goal-setting, seeking assistance, environmental structure, responsibility, and organizing. Wang et al. [12] and Littlejohn et al. [13] also emphasized that online learners depend on self-regulated learning in a virtual space due to significant autonomy in making instructional choices.

In sum, the respondents' very high level of self-regulation implies that they are motivated and dedicated in their online studies through the MOOCs. Their self-regulation in online learning accounts for the strongest reason behind their MOOC accomplishments. Applying self-regulation in online studies through metacognition, time management, environmental structuring, help-seeking, and persistence brings an individual a meaningful and favorable learning experience.

3.7 Level of the Learning Outputs Achieved by the Davao del Norte MOOC Learners

Table 2 shows that the level of learning outputs achieved by the Davao del Norte MOOC learners is excellent, with an overall mean score of 97.40%, which falls in the bracket of 95–100. Most scores in the data dispersed about 3.58 from the mean based on the total standard deviation. Christensen et al. [14] support this result, stating that the learners' main reasons for taking a MOOC were to satisfy their curiosity and advance in their current job. Abdel-Maksoud [15] also further highlighted those learners enrolled in MOOCs because of their desire to learn new things, the perception that MOOC is interesting, and the need for CV credentials. He added that the benefits the learners get in joining the MOOCs are valuable learning resources, flexible learning structure and schedule, and technical competency development. In line with the result, Salmon et al. [16] expounded that MOOCs are an avenue for professional development opportunities that can provide relevant experience for educators and promote new skills in learning design and delivery for instructional use. Similarly, Mabuan et al. [17] also strengthen the result, emphasizing that MOOCs are instrumental for professional teachers to achieve personal and professional development. They further stressed that teacher participants completed MOOCs to get a certification, access online educational resources, and engage in a new learning model. These studies explain why MOOC participants pursue online studies and earn remarkable accomplishments simultaneously.

Having an excellent level of learning outputs suggests that the teacher participants of MOOC are motivated in their online studies for self-directed and lifelong learning.

Table 2. Learning Outputs or Grades of the Davao del Norte MOOC Learners

Municipality/City	N	Mean Score	SD	Description
Tagum	50	96.04	3.57	Excellent
Carmen	30	98.08	3.60	Excellent
Sto. Tomas	50	99.60	3.62	Excellent
Kapalong	45	98.06	3.59	Excellent
Asuncion	60	95.07	3.53	Excellent
Panabo	55	97.56	3.58	Excellent
Overall	290	97.40	3.58	Excellent

Table 3. Test of Relationship between Personal Self-Regulation and MOOC Learning Outputs

Personal Self-Regulation	r	Degree Of Relationship	p-value	Decision at 0.05 Level
Metacognition	.884	Strong	.000	Significant
Time Management	.812	Strong	.000	Significant
Environmental Structuring	.842	Strong	.000	Significant
Help Seeking	.853	Strong	.000	Significant
Persistence	.871	Strong	.000	Significant
Overall	.852	Strong	.000	Significant

They acknowledge the MOOCs as a platform wherein they can grow personally and professionally in their career while widening their professional circles. Aside from that, joining MOOCs also empowers them to gain new skills in learning design and modern ways of instructional delivery in their respective classes.

3.8 Relationship Between the Self-regulation and Learning Outputs of MOOC Learners Testing

Table 3 shows the results of the relationship between the self-regulation and learning outputs obtained by the Davao del Norte MOOC learners testing. The authors show that the overall R-value of the test is 0.852, implying a strong correlation between the dependent and independent variables. The authors also discover that the overall p-value of such a test is 0.000, indicating that the strong relationship between the two variables is statistically significant at 0.05.

According to Villavicencio and Bernardo [18], self-regulation is positively associated with grades for students with higher enjoyment and pride in their studies. However, they added that self-regulation was not related to grades for those with lower levels of pride, and self-regulation was negatively related to grades for those with lower levels of enjoyment. Self-regulated learning interventions were also effective in improving the learners'

course performance, SRL knowledge and activities, and general academic achievement [8, 19–21]. Self-regulation, computer self-efficacy, and self-esteem in online courses were positively correlated with students' emotional and cognitive engagement factors [22].

The findings of Abun & Magallanes [23] contradicted these results by stating that there is no correlation between academic self-regulation and academic performance. They further emphasized that academic performance could be caused by other factors not covered in their study. Hence, these researchers show that self-regulation, in tandem with desirable emotions and attitudes, may improve or not the learning performance and outputs of students. A strong correlation between self-regulation and MOOC learning outputs suggests that as one variable increases or decreases, so does the other. Their strong relationship confirms that where there is a very high level of self-regulation among learners, an excellent level of their MOOC learning outputs follows. Apparently, the relationship between these two variables may imply that they are compatible with educational purposes.

Therefore, there is a strong and significant relationship between self-regulation and MOOC learning outputs. These findings affirm that a unit increase in self-regulation among online learners guarantees a unit increase in their level of learning outputs in MOOCs. Conversely, if there is a unit decrease in their level of self-regulation, the same unit decrease is also expected to their level of MOOC learning outputs.

3.9 Significant Predictors of Learning Outputs in MOOC

Table 4 shows that the identified regression model in this study, with a significant overall p-value of 0.000 less than 0.05, can significantly predict the learning outputs of MOOC learners. Among the five regression models that emerged, this is the only regression model whose all indicators have p-values less than 0.05; hence, it can significantly predict the outcome. This means that the self-regulation indicators in the model, namely: (1)

Table 4. Self-Regulation Predictors of MOOC Learning Outputs

	Unstandardized Coefficient		Standardized Coefficient	Sig.	Effect Size	Adjusted r2	Sig.
	B	SE	B				
Model							
(Constant)	69.296	.509		.000			
Metacognition	1.019	.094	.335	.000			
Time Management	.281	.087	.094	.001			
Environmental Structuring	.580	.088	.193	.000			
Help Seeking	.678	.083	.240	.000			
Persistence	.704	.112	.208	.000	11.35	.919	.000

metacognition, (2) time management, (3) environmental structuring, (4) help-seeking, and (5) persistence, are all significant predictors of the MOOC learning outputs.

The predictive power of the regression model is very high, with an overall adjusted r^2 of 0.919, having a significant p -value of 0.000. This r^2 value indicates that the predictors in the model explained about 91.90% of the variation in the MOOC learning outputs. With such a high value, this regression model is reliable for use should there be further replications of this study. The signs of indicators in the model, such as metacognition, time management, environmental structuring, help-seeking, and persistence, behave as expected based on literature and are consistently aligned to the Self-Regulation Theory (SRT) by Jansen et al. [8].

Below is the multiple regression equation derived from the model in Table 4. This equation is patterned after the statistical equation for multiple regression whereby the y symbolizes the dependent variable, the series of x symbolizes the independent variables, and e for the standard error. In addition, the equation is composed of unstandardized coefficient values for each self-regulation indicator to be multiplied by the mean of each indicator in a survey. Kindly see Eq. (1).

$$y = 69.296 + 1.019(x_1) + 0.281(x_2) + 0.580(x_3) + 0.678(x_4) + 0.704(x_5) + e$$

$$(0.000) (0.001) (0.000) (0.000) (0.000)$$

$$R^2 = 0.919 \tag{1}$$

4 Conclusion

The Davao del Norte MOOC online learners attained an overall mean score of 8.596 on a 10-point scale from the five indicators of self-regulation. This score signifies their very high level of self-regulation in learning the MOOCs for continuous professional development. In the MOOC, Teaching English to Young Learners, the respondents achieved an overall mean score of 97.40% for their accumulated learning outputs as one camp. This value indicates that they obtained an excellent level of learning outputs in studying such online courses. Moreover, with an overall R -value of 0.852 and a p -value of 0.000, there was a significantly strong correlation between self-regulation in online learning and the learning outputs of the Davao del Norte MOOC learners. All variables of self-regulation: 1) Metacognition, 2) Environmental structuring, 3) Persistence, and 4) Help-seeking were found to be significant predictors of the MOOC learning outputs, each with $p \leq 0.05$.

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