



# SELF-LEARNING MODULE (SLM) DIMENSIONS AND STUDY HABITS AS PREDICTORS OF ACADEMIC PERFORMANCE OF STUDENTS IN MATHEMATICS

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## ABSTRACT

This study determined whether self-learning module (SLM) dimensions and study habits significantly predict students' academic performance in mathematics. It utilized the descriptive correlational design method of research. There were 337 Grade 10 students selected through stratified random sampling from four public secondary schools of New Corella District in the Division of Davao del Norte. Three sets of research instruments were used in this study; one was a modified survey instrument to determine the level of SLM dimensions, another was an adapted instrument to determine the level of study habits, and a modified test instrument to determine the academic performance of students in mathematics. The Statistical tools which were applied were mean, Pearson  $r$ , and regression analysis. The findings suggested that the SLM dimensions meet learners' needs on almost all occasions while their study habits were manifested on most occasions. Moreover, the academic performance of students in mathematics was moderately proficient. Accordingly, there was a significant relationship between SLM dimensions and academic performance. However, the data is sufficient, yet it proved the claim that there's no relationship between study habits and academic performance. Therefore, SLM dimensions significantly predicted students' academic performance in mathematics, while study habits did not significantly predict students' academic performance in mathematics. Teachers and school administrators are encouraged to administer effective learning interventions by promoting students' good study habits while implementing SLM.

**KEYWORDS:** Math education, self-learning module dimensions, study habits, academic performance, grade 10 students, descriptive and correlational design, regression analysis, New Corella District, Davao del Norte, Philippines

## INTRODUCTION

In learning Mathematics, there are many reasons how the students' performance is affected. Yet, despite the great effort in education, students' academic performance in Mathematics is still not promising (National Research Council, 2002).

In reality, the PISA report (2012) revealed that Indonesian students' mathematics achievement scores are extremely poor, with the country ranking 64th out of 65 countries (Ajisuksmo & Saputri, 2017). In Kenya, poor attitude is one of the identified contributory factors to students' low achievement in Mathematics in most secondary (Mbugua et al., 2012).

The low achievement in Mathematics is also a problem in the Philippines. In the World Economic Forum's 2015-2016 Global Competitiveness Report, the Philippines was ranked 67th out of 140 countries in mathematics education efficiency and 79th out of 138 countries in 2016-2017 (Dela Cruz, 2017). According to Ranis (2020), findings revealed that academic performance in Mathematics of Junior High School students fluctuated between 84 and 79 from 2015 to 2019 in one of Davao del Norte's campuses, ranging from 84 to 79. This became an alarming situation since this school is known to be a performing school in all academics and talents in the said division.



As a result, researchers have looked into the relationship between teaching methods and student study patterns, and academic success. Modules are the learning materials used in the independent learning approach during the new normal. Meanwhile, Ranis (2020) mentioned in her study that students must be conscious of their best ways of acquiring learning to create effective study habits. Thus, this paper proposed to fill a knowledge gap surrounding self-learning modules based on this phenomenon dimensions and study habits as predictors of students' academic performance.

This study aims to be part of the solution by providing relevant information on the use of self-learning modules that would help the government develop an improved and effective educational reform to benefit the learners during this pandemic crisis. Hence, this study aims to assess and evaluate the implemented self-learning modules by DepEd and the students' study habits as predictors of their mathematics academic success.

The main thrust of this research was to determine whether the self-learning module dimensions and study habits significantly predict the academic performance of Grade 10 students in mathematics. Specifically, this study has answered the following: the level of self-learning module (SLM) dimensions in terms of content, language, presentation and assessment, the level of study habits of students in terms of time management, concentration, note-taking and reading skills, the academic performance of students in Mathematics, the significant relationship between SLM dimensions and the academic performance of students in Mathematics, the significant relationship between study habits and the academic performance of students in Mathematics and if the SLM dimensions and study habits significantly predict the academic performance of the students in Mathematics.

Moreover, this study is anchored to Khalil, Nelson, & Kibble (2010) that self-learning modules have been shown to effectively improve student understanding and facilitate learning. Vergara (2017) found that students can rely on their understanding and develop their problem-solving skills from a module based on content, language, presentation, and assessment. In addition, this study is supported by the suggestion made by Ammara and Syeda (2017) that that effective study habits could lead to good academic performance. The Bashir and Matto study (2012) noted that the adapted inventory used in the study looked at the overall level of study habits among students focused on time management, note-taking, concentration, and reading skills. These indicators are therefore used in this study.

## METHODS

This study utilized a descriptive correlational design. Descriptive correlational studies describe the variables and the relationships that occur naturally between and among them (Sousa et al., 2007).

The respondents of the study were the 337 Grade 10 students of the 4 public secondary schools of New Corella District in the Division of Davao del Norte enrolled in school year 2020-2021. Stratified random sampling technique was used in the selection of the respondents.

To measure the SLM dimensions, an adapted questionnaire from Vergara (2017) was used and the researcher modified some items to fit the students' level of understanding having a cronbach alpha value of 0.781 which means that the internal consistency was acceptable. To measure the study habits of students, an adapted questionnaire from Ranis (2012), a modified version of Bashir, I., & Mattoo, N. H. (2012) was used having a Cronbach alpha value of 0.826 which means that the internal consistency was good. The instrument used for the dependent variable, students' academic performance, was adapted from the second quarter unified summative test of Davao del Norte Division for Grade 10 Mathematics and some of the items were modified by the researcher. The questionnaire had a Cronbach alpha value of 0.748 which means that the internal consistency was acceptable. All of the resulted cronbach values of the three questionnaires mentioned was reliable enough to administer to the respondents.

In the statistical treatment of data, this study used Mean, Pearson r and Multiple regression analysis.

## RESULTS AND DISCUSSIONS

### *Summary on the Level of Self-Learning Module (SLM) Dimensions*

**Table 1** summarizes the level of SLM dimensions. All the ratings resulted in a grand mean of 5.45 described as very high, which means that the level of SLM dimensions meet learners' needs in almost all occasions. The overall standard deviation of 0.93 implies that the data are homogenous and the students are consistent in their responses.



**Table 1**  
**Summary on the Level of Self-Learning Module (SLM) Dimensions**

Indicators	SD	Mean	Descriptive Equivalent
Content	1.03	5.31	Very High
Language	1.00	5.54	Very High
Presentation	1.08	5.37	Very High
Assessment	0.97	5.58	Very High
<b>Overall</b>	<b>0.93</b>	<b>5.45</b>	<b>Very High</b>

The findings suggest that the students perceived that the SLM addresses their learning needs during this pandemic since they can easily relate to the SLM concepts. This is parallel to the discussion of Vergara (2017), which claimed that different teaching methods provide various benefits depending on the situation. The students in their working environment study the modules.

**Summary on the Level of Study Habits**

**Table 2** summarizes the level of study habits with a grand mean of 5.23, which has a descriptive equivalent of High which indicates that the study habits of students is manifested in most occasions. The overall standard deviation of 0.98 implies that the data are homogenous and the students are consistent in their responses.

**Table 2**  
**Summary on the Level of Study Habits of Students**

Indicators	SD	Mean	Descriptive Equivalent
Time Management	1.18	4.98	High
Concentration	0.99	5.50	Very High
Note Taking	1.10	5.21	High
Reading Skills	1.10	5.21	High
<b>Overall</b>	<b>0.98</b>	<b>5.23</b>	<b>High</b>

The findings suggest that students incorporate study habits into their educational development in a systematic way. Study habits must be applied to a greater extent to contribute to more effective knowledge acquisition and complete their academic tasks. Similarly, Cardelle-Elawar and Nevin (2003) expound that study habit is the conscious and purposeful use of one’s cognitive skills, feelings, and actions to maximize the learning of knowledge and skills for a given task and set of conditions. This is also supported by Neal (2007) that study habits assist students in applying their thought processes to identify relevant bodies of knowledge and evaluation of same.

**Academic Performance of Students in Mathematics**

**Table 3** presents the academic performance of students in Mathematics which has a mean of 23 with a descriptive equivalent of Satisfactory. This means that the academic performance of students in Mathematics meets the expectations in some occasions.

**Table 3**  
**Students’ Academic Performance in Mathematics**

Variable	SD	Mean	Descriptive Equivalent
Academic Performance	5.51	23	Satisfactory

This result shows that most of the students perform moderately good in Mathematics subject using the SLM in the new normal education system brought by the crisis of the Covid 19 pandemic. Chaurasia (2020) emphasized that since the SLMs are completely based on the principle of program instruction, it favorably suites the nature of mathematics, as it can be helpful in teaching and learning mathematics by applying to slow learners and the learners with the higher-order cognitive abilities. Self-learning materials can help maintain a satisfactory minimum standard of academic performance of students in mathematics.



***Relationship Between Self-learning Module Dimensions and Academic Performance of Students in Mathematics***

Results presented in **Table 4** revealed that there is a significant relationship between self-learning module dimensions and students' academic performance in mathematics. This means further that students who were exposed to self-learning modules perform moderately good in academics.

**Table 4**  
**Significance of the Relationship between Self-learning Module Dimensions and Academic Performance of Students in Mathematics**

Variables	Mean	SD	r-value	Degree of Correlation	p-value	Decision @ $\alpha=0.05$
Self-learning Module Dimensions	5.45	0.93	0.141	Very Weak Positive Correlation	0.009	Rejected
Academic Performance	23	5.51				

**Coefficient of Determination ( $r^2$ ) = 2%**

This result is strengthened by Malik (2012), who explored the impact of the modular approach on students' overall comprehension at the secondary school level. The study of Hena (1997) on the development of modules in Basic Mathematics as tried out among Teacher Education students proved that students can perform better in Mathematics through the use of modules.

***Relationship Between Study Habits and Academic Performance of Students in Mathematics***

**Table 5** shows that there was no significant relationship between study habits and academic performance of students in mathematics. This means further that the data is sufficient, yet it proved that there is no relationship between the said variables.

**Table 5**  
**Significance of the Relationship between Study Habits and Academic Performance of Students in Mathematics**

Variables	Mean	SD	r-value	Degree of Correlation	p-value	Decision @ $\alpha = 0.05$
Study Habits	5.23	0.98				
Academic Performance	23	5.51	0.072	Negligible	0.184	Not Rejected

**Coefficient of Determination ( $r^2$ ) = 0.5%**

The no significant result is reinforced by Lawrence (2011) that there is no significant relationship between study habits and academic performance of higher secondary students. The factors that may affect the no significant result in his study maybe because there is a turning point in students' life pertaining to their level, they may be accustomed to the routine work scheduled by their parents or guardians, and that they were given freedom in their thinking and doing as to their type of school.

***Regression Analysis on the Self-learning Module Dimensions and Study Habits as Predictors of the Academic Performance of Students in Mathematics***

As can be seen in **table 6**, study habits do not contribute to the regression model. Among the two variables, only self-learning module dimensions are a predictor of academic performance.



**Table 6**  
**Regression Analysis on the Self-learning Module Dimensions and Study Habits as Predictors of the Academic Performance of Students in Mathematics**

Independent Variable	Unstandardized Coefficients		Standardized Coefficients	t-stat	p-value	Decision@ $\alpha = 0.05$
	$\beta$	SE	Beta			
(Constant)	27.233	1.848				
SLM						
Dimensions	1.056	0.450	0.178	2.345	0.020	Rejected
Study Habits	0.291	0.425	0.052	0.684	0.494	Not Rejected
<i>Dependent Variable:</i> Academic Performance				<i>Adjusted R Square:</i> 0.015		
<i>F-ratio:</i> 3.645						

The finding that SLM dimensions predict students' academic performance in mathematics conformed to the study of Vergara (2017), who highlighted that the performance of the learners improved significantly after exposure to the developed modules. This study relates to the study of Samonte (2008), which considered that the comments and suggestions of the student respondents were sufficient grounds for considering the modules to be appropriate and purposeful.

However, the finding that study habits do not predict the academic performance of students in mathematics does not conform to the study of Bashir and Matto (2012), which found that there was a significant relationship among the variables of study habits and the academic performance of the students. Thus, the finding supports the study of Lawrence (2011) that there is no significant relationship between study habits and academic performance of higher secondary students. This also helps the findings of Saini (2013). It can be concluded that study habit was not the only factor. Still, other factors like intelligence and environment influenced academic performance and can bring change in it.

### CONCLUSION

Based on the findings of this study, the researcher concluded that the SLM dimensions meet learners' needs on almost all occasions while their study habits were manifested on most occasions. Moreover, the academic performance of students in mathematics was moderately proficient. Accordingly, there was a significant relationship between SLM dimensions and academic performance. However, the data is sufficient, yet it proved the claim that there's no relationship between study habits and academic performance. Therefore, SLM dimensions significantly predicted students' academic performance in mathematics, while study habits did not significantly predict students' academic performance in mathematics.

### RECOMMENDATION

Based from the conclusions drawn in this the study, other researchers may consider the study's findings to uncover essential issues regarding students' academic performance using self-learning modules (SLM) as an alternative delivery mode of learning and study habits. Similar studies may be conducted having senior high school students as respondents. Studies considering other factors like intelligence and environment that affect academic performance may also be undertaken. Other researchers can use the result of the study to broaden its scope and cater not just to one district but also to other public and private schools in Davao del Norte and nationwide for a more comprehensive study.

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