SELF-PACED MODULE USING SUMMARIZED STRATEGY IN SCIENCE 8 EARTH AND SPACE FOR STUDENTS AT-RISK OF DROPPING OUT (SARDO)

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ABSTRACT

Many Filipinos do not have a chance to attend and finish formal basic education due to many reasons. Some drop out from schools while some do not have schools in their communities. For such cases, the Department of Education finds ways to help those type of learners by introducing the modular approach to teaching. Plaridel Integrated National High School is one of the public schools with alarming number of students at risk of dropping out every year. For the Academic Year 2016-2017 the DORP (Drop out Reduction Program) coordinator registered 29 SARDO while for the Academic Year 2017-2018 listed 31 SARDO and for the Academic Year 2018-2019, the DORP coordinator recorded 36 SARDO. The study employed the descriptive method of research. The respondents of the study included 30 identified Grade 8 students at-risk of dropping out at Plaridel Integrated National High School Nagcarlan-Rizal District, Division of Laguna enrolled during the School Year 2018-2019. Ten teachers composed of Master Teacher, Head Teacher and Grade 8 teachers from different schools in Nagcarlan-Rizal District evaluated the self-paced module. The data in the study was subjected to the following statistical treatments and analyses such as frequency, percentage, and mean formula. These were used to quantify and analyze the profile, test results and perception of the respondents. The t-test for dependent samples was employed to determine the possible significant difference in the pre-test and post-test scores of the students using the designed self-paced module in Earth and Space. Results revealed that there was a significant difference in the pre-assessment and post-assessment performances of the students using the self-paced module in Earth and Space as to their lower and higher order thinking skills. This suggests the use of self-paced module in increasing academic performance of students.

Keywords: Self-Paced Module, Earth and Space, Students At-Risk of Dropping out (SARDO), Difference in Academic Performance

INTRODUCTION

Education is at the crossroads for the future Filipinos. It plays a vital role in decreasing poverty. However, education does not guarantee success rather it will help individuals achieve great things in life. Nowadays, many of the Filipino youth do not finish their education due to poverty. For this reason, the Department of Education (DepEd) finds ways for giving education for all. The establishment of Alternative Learning System (ALS) is one of the means to help poor Filipinos have access to education. Since every Filipino has the right to a free basic education, the Government

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establishes ALS to provide all Filipinos the chance to have access to and complete basic education in a move that fits their distinct situations and needs.

The Governance Act for Basic Education otherwise known as the Republic Act 9155 stipulates the establishment of the Alternative Learning System (ALS) to provide out-of-school children, youth and adults with basic education. The 1987 Philippine Constitution provides for the recognition and promotion of other forms of education other than formal education. Article XIV, Section 2, Paragraph (1) declares that the State shall establish, maintain and support a complete, adequate and integrated system of education relevant to the needs of the people and society; and paragraph (4) concisely encourages non-formal, informal and indigenous learning systems as well as self-learning, independent and out-of-school study programs particularly those that respond to community needs. (Panaligan, 2016),

The Department of Education establishes ALS as an effective means to eliminate the increasing number of drop outs in the public institutions. There were many reasons and causes why students are dropping out of school. These are school-related reasons, family-related reasons and employment-related reasons.

In connection to school-related reasons a student may drop due to the following: getting a poor grade, did not like school, could not get along with teachers, was suspended, did not feel safe and could not get along with others. Meanwhile, for family-related reasons, student gets pregnant (female) and had to support family or to care for a member of the family. In the case of employment-related reason the student needs to work in order to have money to support all the expenses for food, transportation and school projects and requirements.

The following causes may contribute to the increasing number of drop outs. In such cases, DepEd provided an approach to this problem which is the modular approach. Module is a form of self-instructional package. It enables the learner to learn on his own and accepts greater responsibility for learning.

Nonetheless, one of the main problems that teachers face in the public institution these days is the increasing number of students at risk of dropping out. Students identified as SARDO are students who failed to attend regular classes because of several factors such as being working student; learners are taking care of their young siblings; helping their parents with the household chores, insufficient financial resource, teen-age pregnancy, and learner with behavioral problems.

In connection to this, students failed to grasp the information given by the teacher during the teaching process, and consequently fails to comply with all the requirements to be submitted. However, at the end of the academic year the identified SARDO will be promoted to the succeeding year level even without conforming to school requirements.

Presently, as a result of this major problem in the public schools, the researcher would like to provide a self-paced module using summarized strategy in Science 8 Earth and Space for students at-risk of dropping out (SARDO) which is based on Science competencies. This proposed comprised alternative materials that can be understood by the learner by himself. The use of summarizing strategy will aid in helping the SARDO learn the Science competencies. The P-Q-R-S-T method will be incorporated for easy comprehension of the module where the P-Preview gives insights of the topics to be learned; the Q-Questions for the essential questions; R-Read for more valuable readings about the topic; S-State for the central idea; and T-Test a short assessment to evaluate if they learned what they studied. This study will eliminate the alarming and increasing number of drop outs in the public institutions. In addition, it will help at-risk students to continue their study even if they are not attending a regular schooling.

The study follows the independent study style. Independent study is a form of education offered by many high schools, colleges, and other educational institutions. It is sometimes referred to as directed study, and is an educational activity undertaken by an individual with little or no supervision. Typically, a student,

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a professor or teacher agrees upon a topic for the student to research with guidance from the instructor for credits. Independent studies provide a way for well-motivated students to pursue a topic of interest that does not necessarily fit into a traditional academic curriculum.

OBJECTIVES OF THE STUDY

This study aimed to determine the effectiveness of a self-paced module in Earth and Space for Grade 8 students at-risk of dropping out using summarized strategy. Specifically, it attempted to: (1) describe student's interest in school; (2) determine the pre-assessment and post assessment performances of the students in their basic science process skills as to: lower order thinking skills; (Observing, Classifying) higher order thinking skills; (Measuring, Communicating, Inferring, Predicting); (3) determine the perception of the respondents in the effectiveness of the designed self-paced module in Earth and Space as to: graphic design; content; activities; skills; and user-friendliness; and (4) determine significant difference in the pre-assessment and post-assessment performances of the students using the self-paced module in Earth and Space as to their lower and higher order thinking skills.

METHODOLOGY

This study utilized the descriptive method, which basically is developmental in nature. The research applied the IPO system indicating the Input, Process and Output.

The study designed a self-paced module in Earth and Space for Grade 8 students at-risk of dropping out to help at-risk students in their academic achievement. Students identified as SARDO were the students who failed to attend regular classes because of several factors. In connection to this, students failed to grasp the information given by the teacher during the teaching process, they failed to comply with all the requirements to be submitted. However, at the end of the academic year the identified SARDO was promoted to the succeeding year level even without conforming to school requirements.

Most of the SARDO students in this study were 14 years old, male, have three or more number of siblings, have low financial resource, their parents mostly were not professionals and were high school graduates. Their parents were often involved in school activities and students were interested in their Science subject.

Specifically, the self-paced module for SARDO utilized summarizing strategy such as the Preview, Question, Read, State, Test method. This method was about on reading a textbook so that the information really does enter in the long-term memory. Rather, in this method the learner will follow five steps - Preview, Question, Read, State and Test. First of all, the preview where it uses images of the main topic. It will give the learner an overview of what to be learned in the module. Next was the question part wherein essential questions were given so that learners will know the main concept for each module. Third section was the read, wherein the learner will be studying the lecture about the topic. For easy comprehension, the modules included the use of a concept map.

It also contains diagrams and flow chart for the SARDO students to know what they have read. Meanwhile, the state section reviews the main idea of the topic while the last part is the test. In this part, five questions were given to test if the learner understood what they studied. On the other hand, the study executed the following procedures: Approval of the School President, through High School Principal; and filing of the request regarding the conduct of the study and the participation of the students. The potential participants were identified through the class advisers who identified them as SARDO (Students at Risk of Dropping Out).

The researcher developed a 30-multiple choice questions which were used to assess the students' performance in the basic Science process skills in the field of Earth and Space. The teacher-made test was validated by master teachers prior to the conduct of the test. The questions were designed to test the acquisition

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of the basic Science skills process such as observing, classifying, measuring, communicating, inferring and predicting. An attitude and interest assessment were given to the respondents who served as the basis for the construction of the self-paced module. The respondent's attitudes and interest were considered to develop a module fit for at risk students.

The self-paced module served as the main instrument of the study consisting of the following parts: (1) title of the module; (2) learning objectives; (3) pre-test; (4) learning activities which incorporated the summarizing strategy specifically the utilization of the P-Q-R-S-T method; (5) post-test; and (6) summary.

On the basis of enhancement of the self-paced module, criteria pertaining to graphic design, content, activities, skills and user-friendliness were measured. Survey questionnaires were given to the respondents to examine the acceptability of the learning material. They were also requested to give their comments and suggestions for further improvement of the self-paced module.

The data in the study was subjected to the following statistical treatments and analyses: The simple descriptive statistics such as frequency, percentage, and mean formula were used to quantify and analyze the profile, test results and perception of the respondents.
The t-test for dependent samples was employed to determine the possible significant difference in the pre-test and post-test scores of the students using the designed self-paced module in Earth and Space.

RESULTS AND DISCUSSION

1. Extent of Students' Interest in School

Table 1 presents the extent of students' interest in school. It shows that the Grade 8 SARDO are "Very much interested" (mean = 4.33; SD = .71) in performing Science experiments. On the other hand at-risk students are "Interested" (mean = 2.50; SD = 1.14) in reading Science journals and magazines.

Table 1
Extent of Students' Interest in School

Statements	Mean	SD	VI
1. I see the importance of studying.	3.87	.86	MI
2. I intend to know more about Science.	4.33	.96	VMI
3. I read Science journals and magazines.	2.50	1.14	I
4. I enjoy performing Science experiments.	4.33	.71	VMI
5. Science makes me aware of the things around me.	3.87	1.04	MI
6. I like to study Science better than other subjects.	3.33	.84	I
7. I look forward to attending my Science class.	3.67	.92	MI
8. I like to watch Science related movies.	3.73	1.20	MI
9. Scientific work does interest me.	3.47	.90	MI
10. I look forward to Science lessons.	3.57	.77	MI
General Mean	**3.67**	**0.94**	**MI**

The result reflects that the students are "Much Interested" (general mean = 3.67; SD = 0.94) in Science related-activities. Students these days find Science as a difficult subject. However, the respondents are still interested in Science because they see the importance of studying the subject. Hence, even the subject is too difficult for the students, they still want to explore Science concepts through experiments, watching Science-related movies, reading books and journals. This confirms that even the students at-risk of dropping out show interest in the Science subject.

2. Pre-assessment and Post-assessment Performances of Students

2.1 In terms of lower order thinking skills; (Observing, Classifying)

Table 2 presents the pre-assessment and post-assessment performances of students in lower order thinking skills in Science. Most of the students fall in the beginning level (frequency= 16; percentage= 53.33 %) in the pre-assessment because grade 8 students at-risk of dropping out failed to attend their regular classes for that reason they did not learn the Science

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competencies during the teaching and learning process.

Table 2
Pre-assessment and Post-assessment Performances of Students in Lower Order Thinking Skills in Science

Rating	Pretest		Posttest	
	Frequency	Percentage	Frequency	Percentage
90%-100%	0	0.00%	1	3.33%
85%-89%	0	0.00%	6	20.00%
80%-84%	1	3.33%	10	33.33%
75%-79%	13	43.33%	8	26.67%
74% and below	16	53.33%	5	16.67%
Total	**30**	**100.00%**	**30**	**100.00%**

Upon utilizing the self-paced module in Earth and Space they became approaching proficient (frequency= 10; percentage= 33.33 %). The use of different learning strategies in the construction of learning material will help learner increase their academic performance. The self-paced module contains variety of learning techniques in order to help the learners remember the concept they have studied. The use of concept map and flow chart helps in understanding and remembering factual information included in the module. It verifies that the use of summarizing strategy in the construction of a learning material can enhance students' academic achievement. It indicates that the self-paced module in Earth and Space for Grade 8 students at-risk of dropping out helped increase the academic performance of the students in the lower order thinking skills in Science.

2.2 In terms of higher order thinking skills; (Measuring, Communicating, Inferring, and Predicting)

Table 3 shows the pre-assessment and post-assessment performances of students in higher order thinking skills in Science. Most of the students fall in the beginning level in the pre-assessment (frequency= 21; percentage= 70.00 %) due to absenteeism, As a result they failed to learn the competencies during the teaching process.

Table 3
Pre-assessment and Post-assessment Performances of Students in Higher Order Thinking Skills in Science

Rating	Pretest		Posttest	
	Frequency	Percentage	Frequency	Percentage
90%-100%	2	6.67%	13	43.33%
85%-89%	1	3.33%	4	13.33%
80%-84%	3	10.00%	5	16.67%
75%-79%	3	10.00%	2	6.67%
74% and below	21	70.00%	6	20.00%
Total	**30**	**100.00%**	**30**	**100.00%**

After using the self-paced module in Earth and Space they became advanced (frequency= 13; percentage= 43.33 %). One of the features used and presented in the self-paced module is the preview section wherein before the learner read a lot of information about the main topic they will be seeing vivid images as an overview of the lesson. Therefore, they certainly learn the concept and able to achieve the objectives for each lesson. Aside from the preview section the module also has state part wherein the central idea of the lesson were presented and given emphasis. This learning strategy helps the student remember important information.

This study verified the effectiveness of the self-paced module in Earth and Space for Grade 8 students at-risk of dropping out in enhancing the academic performance of the students in the higher order thinking skills in Science.

1. Summary of the Perception of the Respondents on the Effectiveness of Self-Paced Module in Earth and Space for Grade 8 SARDO Using Summarized Strategy

Table 4 presents the summary of the perception of the respondents on the effectiveness of self-paced module in Earth and Space for Grade 8 SARDO using summarized strategy. The respondents perceived the self-paced module in Earth and Space for grade 8 students at-risk of dropping out to be "Excellent"

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in terms of its graphic design, content, activities, skills and user-friendly.

Table 4
Summary of the Perception of the Respondents on the Effectiveness of Self-Paced Module in Earth and Space for Grade 8 SARDO Using Summarized Strategy

Criteria	Mean	SD	VI
Graphic Design	4.72	0.47	E
Content	4.60	0.51	E
Activities	4.56	0.50	E
Skills	4.52	0.54	E
User-friendliness	4.64	0.49	E
General Mean	**4.61**	**0.50**	**E**

In general, the self-paced module in Earth and Space is perceived by the respondents as "Excellent" (general mean = 4.61; SD = 0.50). It reveals that the objectives of the module were attainable and aligned with the Science competencies given by the department of education. Summarizing strategy was incorporated in the module to simplify the content. Instructions and activities were made easy for the learner to understand at their own pace. The thoughts of the module are well founded and grounded, well organized and use variety of resources. The learning material serves a linkage for students who need support group through their mentors.

2. Test of Difference between Pre-assessment and Post-assessment Performances of the Students in their Basic Science Process Skills

Table 5
Test Difference between Pre-assessment and Post-assessment Performances of Students in their Basic Science Process Skills

Basic Science Process Skills	Pre-Test		Post Test		Paired Differences		95% CI of the Difference		t	p-value
	Mean	SD	Mean	SD	Mean	SD	Lower	Upper		
Lower	72.42	4.46	80.30	5.97	-7.88	6.18	-10.185	-5.572	-6.987	0.000
Higher	70.50	8.94	83.33	10.37	-12.83	12.98	-17.679	-7.987	-5.416	0.000

Table 5 reveals the test of difference between the pre-assessment and post-assessment performances of students in their basic Science process skills. The computed p-value of 0.000 for the lower order thinking skills and higher order thinking skills showed that there was significant difference in the pre-assessment and post-assessment scores of the students since the value was less than 0.05. The self-paced module in Earth and Space for Grade 8 students at-risk of dropping out (SARDO) using summarizing strategy proved its effectiveness for independent study. The following characteristics of the learning material such as easy to follow directions, utilization of concept map, state section, and summary helped in remembering factual information about the lesson. For instance, these features of the learning material support in the increase of test scores in the post-assessment.

The results imply that the module helped in improving the lower order thinking skills of students as shown by the increase in the level of proficiency from beginning to approaching

proficiency. Moreover, in terms of higher order thinking skills it showed the improvement from beginning to the advanced level. With this, the study of Garillos (2012) supports the findings of this study about development and validation of module in Biology for second year high school. Result showed that there was a significant increase in the pre-test and post-test results of the students when the instructional material was introduced to the class. The instructional modules form an important educational innovation and teaching technique.

CONCLUSIONS

The study intended to design a self-paced module in Earth and Space for Grade 8 students at-risk of dropping out using summarized strategy to help eliminate the increasing and alarming number of drop outs in the public institution. The study yielded the following findings.

1. Most of the respondents are 14 years old, male, have three or more number of siblings, have low financial resource, their parents mostly are not professionals and are high school graduates. They are interested in Science subject and their parents are often involved in school activities.
2. There is a significant difference in the pre-assessment and post-assessment performances of the students in their basic science process skills. Most of the students fall in the beginning in the pre-assessment as to their lower order thinking skills. Upon utilizing the self-paced module in Earth and Space they reached the approaching proficient level. Most of the students fall in the beginning level in the pre-assessment of their higher order thinking skills and after they have used the self-paced module in Earth and Space, they reached the advanced level.
3. The respondents perceive the self-paced module in Earth and Space for Grade 8 students at-risk of dropping out as excellent

in terms of graphic design, content, activities, skills and user-friendliness.
4. There is a significant difference in the pre-assessment and post-assessment performances of the students using the self-paced module in Earth and Space as to their lower and higher order thinking skills while there is a significant difference between the pre-assessment and post-assessment performances of the students in their lower order thinking skills and higher order thinking skills using the self-paced module in Earth and Space for Grade 8 students at-risk of dropping out (SARDO) using summarized strategy. The null hypothesis posited in the study is not supported.

RECOMMENDATIONS

Since the study revealed that there is a significant difference between the pretest and posttest scores using the self-paced module in Earth and Space for Grade 8 students at-risk of dropping out (SARDO) using summarized strategy it is recommended that:

1. The school and division administration may use the self-paced module to help students at-risk of dropping out (SARDO) continue their studies since some of them are working students.
2. Teachers may develop similar module to help SARDO succeed in their studies.
3. Further study on the effectiveness of the self-paced module can be made in the future with a larger sample size coming from different schools.
4. The assessment may be treated with item-total statistics to increase the reliability of the assessment since, ten-item assessment for each category of basic Science process skills and placement of the items is completely at random.
5. Future researchers may conduct similar study which may develop learning modules in other fields of science such as matter, force and energy and living things and their environment. The study can be used as a

continuous project to lessen the number of dropouts in High School.

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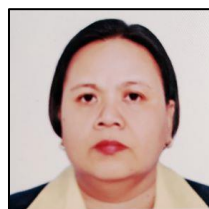
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