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ORIGINAL ARTICLE

Scientific Comic Strips Magazine: Effect on the Science **Vocabulary Level of Sixth Grade Learners**

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This study is intended to use Scientific Comic (SciCom) Strips as an intervention to improve vocabulary levels and enhance the understanding of grade six learners in a science context. The researchers utilized a quantitative method using a quasi-experimental design with a one-group pretest-post-test. Additionally, purposive sampling technique was utilized to identify the participants and the data gathered from their pre-test and post-test were treated using a t-test. The findings revealed that the mean of pretest and post-test in the conceptual function is 3.86 along with standard deviation of 1.839 and 9.67 along with standard deviation of .756. Furthermore, the mean difference of the pretest and post-test is -5.81 and a mean percentage score of 38.61% and 96.67% while the mean of pretest and post-test in the operational function is 2.91 along with standard deviation of 1.653 and 9.81 along with standard deviation of 668. Furthermore, the mean difference of the pretest and post-test is -7.000 and a mean percentage score of 28.06% and 96.06%. It means that the scientific comic strips magazine is effective in improving vocabulary level of grade 6 learners. The illustrations and contextualized dialogues helped the pupils understand the concept and unlock scientific vocabulary difficulties. Moreover, it developed the grade 6 learners' conceptual and operational ideologies. It can be concluded that the intervention material utilized is effective since the post-test mean is greater than the pretest mean. Moreover, the material is an efficient springboard to unlock scientific terminologies and understand it conceptually and operationally. Integration of illustrations is a way to catch

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ABSTRACT

the attention of the pupils to get read the words and apply distinct imagination.





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INTRODUCTION

The curriculum reforms the The Philippine government has aimed to enhance the academic performance of basic education students. However, data from the National Achievement Test (NAT) over the past three years shows a consistent decline in student performance, with many learners achieving levels categorized as "low mastery" or "low proficiency." (Department of Education Regional, 2019). Furthermore, the Program for International Student Assessment (PISA) report released in December 2023 ranked the Philippines among the bottom 10 out of 81 countries in reading comprehensions, mathematics, and science. The country recorded 6.9% achievement rate in reading, along with a 0.8 decline in science proficiency. In line with this, several issues were identified and one of these is the misalignment of learning outcomes of the curriculum and materials utilized during the teaching-learning process. According to Learning Recovery Plan 2022-2024 published by the Schools Division of Bulacan the result of exit assessment in all subjects for key stage 2 (Grades 4, 5, and 6) revealed mean scores ranging from 10.83 to 47.96 and proficiency levels ranging from 24.26 to 72.22, which are all below the expected value of at least 75%. Perhaps, Science is identified as the second to the low subject that has low mean (15.97) and proficiency level (41.86). These results call for a need to further address the learning gaps that emerged from the least-learned competencies and the factors behind those gaps. Additionally, table 1 shows that grade 6 pupils of Lambakin Elementary School got and overall LAEMPL of 15.82%, and it shows that the highest mean from the four sections is 27.35 with a minimum proficiency score (MPS) of 55.60. On the contrary, the lowest mean among the four sections is 16.73 with a minimum proficiency score (MPS) of 34.78. Moreover, the first Quarter Classification of grades for S.Y. 2023-2024 in science showed that 52.35% of grade 6 pupils of Lambakin Elementary School got a range of 75% - 79% as their final grade in science while 44.16% in second guarter classification of grades. In line with this, the result of the teacher-made assessment shows that during the first guarter of the S.Y. 2023 -2024 3, 32.21 % of the grade 6 pupils passed the test and 46.75 % in the second guarter. It meant that the grade 6 pupils had difficulty understanding the lessons in Science 6.

Vocabulary plays a crucial role in predicting overall reading comprehension and learner performance. Learners with a broad vocabulary are better equipped to read and understand complex texts and contexts. Similarly, writers with an extensive vocabulary can create more sophisticated and well-crafted documents. (ETA Public Broadcasting, 2023). Additionally, vocabulary level refers to the number of words a learner understands. It generally assesses a learner's familiarity with the word's form and their ability to associate that form with its meaning (Uchihara & Clenton, 2020).

Usage of unique instructional materials is a significant way of making an educational status stable. It sustains the learning opportunities of the learners. Moreover, these will serve as interventions toward the learning gaps. It is accompanied by written discussions and multiple assessments that adhere to the different learning objectives, especially to the core subjects (English, Mathematics, Science). Formative, summative, confirmative, norm-referenced, and criterion-referenced that can measure the learners' improvement and acquisition. Instead of, the researchers aimed to use Scientific Comic (SciCom) Strips as an intervention to improve vocabulary levels and improve the understanding of grade six learners in a science context. Scientific Comic (Sci-Com) Strips are deployed in a specific order for graphic contextualization that conveys information or definition, the best-known example of sequential art is comics. The researchers utilized sequential art as a springboard towards science contextual vocabulary acquisition. Comic strips offer three primary advantages in language-learning classrooms. Firts, they engage and motivate younger learners. Second, they present context and well-structured



sentences that support language learning. Third, the visuals in comic strips aid impoving comprehension. The author contends that comic strips can be integrated into reading exercises and other skill advancement activities. (Eric, 2018). According to English, Teaching, Learning, and Research Journal (ETERNAL), 2021 old studies have evidence that comic strips in teaching language can promote pupils' vocabulary, develop pupils' grammar competence, support the learners' reading skills, and help the learners who lack writing skills.

This action research distinguished the effect of the Scientific Comic (SciCom) Strips in improving the Science vocabulary level of the grade 6 pupils. It answered the following questions what are the pre-test and post-test scores of grade 6 learners in terms of conceptual Function and operational function? Is there any significant disparity between the pre-test and post-test of grade 6 learners 'in terms of conceptual function and operational Function? And what is the pupils' perception of the Scientific Comic Strip Magazine?.

Research Questions

This action research distinguished the effect of the Scientific Comic (SciCom) Strips in improving the Science vocabulary level of the grade 6 pupils. Particularly, It aimed to answer the following questions:

- 1. What are the pre-test scores of grade 6 learners in terms of:
 - 1.1. Conceptual Function
 - 1.2. Operational Function
- 2. What are the post-test scores of grade 6 learners in terms of:
 - 2.1. Conceptual Function
 - 2.2. Operational Function
- 3. Is there any significant difference between the pre-test and post-test of grade 6 pupils in terms of:
 - 3.1. Conceptual Function
 - 3.2. Operational Function
- 4. What is the pupils' perception of the Scientific Comic Strip Magazine?

METHODS

Study Design

Quasi-experimental research is a type of experimental research which there is a manipulation of an independent variable (MacDonald, 2018). In this study, the treatment group received the pre-test and post-test measurements and was exposed to the Scientific Comic (SciCom) Strips. The data gathered from the pre-test and post-test and treated using a t-test to identify the significant relationship between the SciCom Strips and the vocabulary level of grade 6 pupils. Furthermore, the participants of the action research are 21 male and 15 female grade 6 pupils from section Aguinaldo of Lambakin Elementary School of School Year 2023 – 2024.

Population and Sample

The researchers utilized a purposive sampling technique. The participants were 21 male and 15 female grade 6 pupils from section Aguinaldo of Lambakin Elementary School of School Year 2023 – 2024. They were heterogeneous in terms of age and academic status.



Instrumentation

The test is 20 items in multiple choice formats consisting of two parts such as conceptual and operational definition. It is based on the Fourth Quarter Most Essential Learning Competencies (MELCS). Furthermore, to measure the perspective of the participants about the Scientific Comic Strips Magazine the researchers created a modified Likert – scale survey questionnaire. The pretest was executed for the participants of the study. The participants were given their equivalent code to keep their identity confidential. Furthermore, after the intervention, the post-test was administered.

Data Analysis

The results were encoded using MS Excel for statistical treatment. The distinction in the findings of the pretest and post-test of the participants was determined by the Sample Paired T-Test. Furthermore, to measure the perspective of the participants about the Scientific Comic Strips Magazine the researchers utilized a modified Likert-scale survey questionnaire, and the attached independent activities were analyzed using the descriptive statistics particularly standard deviation.

RESULTS

Regarding the aim of this research, the detailed results of the validated research instruments aligned with the stated research questions are manifested in this section. Through the chosen statistical analysis, the said results were interpreted, presented, and discussed as follows.

The Level of Performance of Grade 6 Learners in Science 6 Prior to the Implementation of the Sciencetific Comic (SciCom) Strips Magazine

Assessing performance in the pretest establishes a baseline for measuring improvement after implementing an innovation. This serves as the foundation for determining whether the intervention had any impact.

	CONCEPTUAL	OPERATIONAL
Pupils	PRETEST	PRETEST
1	2	3
2	5	3
3	3	2
4	5	1
5	1	1
6	3	3

Table 1. Pretest Scores Of Grade 6 Learners in Conceptual And Operational Functions



7	5	i i	6
8	2	: :	2
9	3		1
10	2	:	3
11	2	:	3
12	5		5
13	1	:	2
14	6	, :	3
15	2		1
16	7	,	1
17	5	;	2
18	3	:	3
19	2	2	3
20	4		2
21	5	;	4
22	3	:	3
23	4		3
24	7	,	4
25	3		5
26	6		1
27	5		5
28	6		4
29	3		1
30	2	<u>.</u>	2
31	4		6
32	1		1
33	7		7
34	7		3



35	3	0
36	5	2

Table 1 exhibited the pretest scores of grade 6 learners in the conceptual and operational functions. The data showed that in the conceptual function 6 out of 36 grade 6 pupils or 16.66% of the total participant's achievement rate. On the contrary, in the operational functions 3 out of 36 grade 6 pupils or 8.33% of the total participants achievement rate. Moreover, 7 is the highest achieved score and 0 is the lowest in both.

The Level of Performance of Grade 6 Learners in Science 6 After the Implementation of the Sciencetific Comic (SciCom) Strips Magazine

Upon the completion of the implementation, a post-test assessment was executed to evaluate any improvements in learners' performance in Science. Following the intervention using the Sciencetific Comic (SciCom) Strips Magazine, the performance levels of Grade 6 learners in conceptual and operational functions showed an increase.

	CONCEPTUAL	OPERATIONAL
Pupils	POST-TEST	POST-TEST
1	10	10
2	10	10
3	10	10
4	10	10
5	8	10
6	10	10
7	10	10
8	10	10
9	9	10
10	10	10
11	10	10
12	10	10
13	8	10

Table 2. Post-test Scores of Grade 6 Learners in Conceptual and Operational Functions



14	10	10
15	10	10
16	10	9
17	10	10
18	10	10
19	10	9
20	10	10
21	8	10
22	10	10
23	10	10

Table 2 exhibited the post-test scores of grade 6 learners in the conceptual and operational functions. The data showed that in the conceptual function 36 out of 36 grade 6 pupils or 100% of the total participants' achievement rate. On the other hand, in the operational functions 36 out of 36 grade 6 pupils or 100% of the total participants achievement rate. Moreover, 10 is the highest achieved score and 7 is the lowest in both functions.

The Comparison of the Grade 6 Learners' Level of Performance in Conceptual Function Prior and After the Implementation of the Sciencetific Comic (SciCom) Strips Magazine

A noticeable change in learners' performance levels before and after the intervention can be observed by comparing their mean scores and MPS. Identifying these differences is crucial in determining whether the intervention achieved its intended outcome.

Table 3. Significant Difference of Pretest and Post-test of Grade 6 Learners in Conceptual Function

	Mean	Ν	Std. Deviation	Mean Difference	MPS
Pretest	3.86	36	1.839		38.61%
				-5.81	
Post-test	9.67	36	.756		96.67%

The table 3 reveals that the mean of the pretest and post-test in the conceptual function is 3.86 along with standard deviation of 1.839 and 9.67 along with standard deviation of .756. Furthermore, the mean disparity between the pretest and post-test is -5.81, and a mean percentage score of 38.61% and 96.67%.



The Comparison of the Grade 6 Learners' Level of Performance in Operational Function Prior and After the Implementation of the Sciencetific Comic (SciCom) Strips Magazine

	Mean	Ν	Std. Deviation	Mean Difference	MPS
Pretest	2.91	36	1.653		28.06%
				-7.000	
Post-test	9.81	36	.668		96.06%

Table 4. Significant Difference of Pretest and Post-test of Grade 6 in Operational Function

Table 4 shows that the mean of the pretest and post-test in the operational function is 2.91 along with standard deviation of 1.653 and 9.81 along with standard deviation of. 668. Furthermore, the mean disparity between the pretest and post-test is -7.000, and a mean percentage score of 28.06% and 96.06%.

The Perceptions of Grade 6 Learners on the Scientific Comic (SciCom) Strips Magazine as an Aid to Independent Learning

Understanding learners' perceptions of the Scientific Comic (SciCom) Strips Magazine provides valuable insights for enhancing its effectiveness and highlights distinctions from traditional classroom teaching methods. By gathering and analyzing learners' feedback, researchers can identify areas where the Scientific Comic (SciCom) Strips Magazine excels and where it may fall short compared to conventional teaching.

INDICATORS	YES	NO			
Content					
1. The instructions are easy to understand.	36	0			
2. The dialogues in the comic strips are readable	34	3			
3. The independent activities in the material are engaging.	36	0			
4. The contextualized material is informative.	36	0			
5. The illustrations are clearly explaining the concept.	36	0			
Layout					
1.The instructions are easy to understand	36	0			
2. The illustrations are unique or original.	36	0			
3. The layout has a good complementary colors.	36	0			

Table 5. Pupils' Perception of the Scientific Comic Strip Magazine



4. The characters in the comic strips catch the interest of the pupils.	36	0
5. The overall layout motivates the pupils to read the content.	36	0

Table 5 shows that 36 out of 36 participants agreed that the scientific comic strips magazine has instructions that are easy to understand the contextualized is informative, the independent activities are engaging, and the illustrations clearly explain the concept. In line with this, the participants distinguished the layout of the intervention material as creative, unique, and depicting a good concept, and having good complementary colors. The characters are catchy among the participants and motivate them to read the content. In line with this, it meant that the intervention material utilized was effective since the post-test mean was greater than the pretest mean. Moreover, the material is an efficient springboard to unlocking scientific terminologies and understanding them conceptually and operationally. Integration of illustrations is a way to catch the attention of the pupils to read the words and apply distinct imagination. According to the research study of Nicholas, 2014 from Louisiana State University and Agricultural and Mechanical College titled "An exploration of the impact of picture book illustrations on the comprehension skills and vocabulary advancement of emergent readers", Pupils who were exposed to the graphics supporting a picture book showed better overall story comprehension and retelling skills compared to those who did not view the images. Additionally, the study indicated that pupils who saw the illustrations while the story was being read to them experienced greater vocabulary advancement indirectly than those who did not have access to the images during the reading. It means that illustrative materials have a greater impact than textual definition alone.

CONCLUSION

The significant results of the executed action research study concluded that the scientific comic strips magazine is effective in improving the vocabulary level of grade pupils. The illustrations and contextualized dialogues helped the pupils understand the concept and unlock scientific vocabulary difficulties. Moreover, it developed the grade 6 pupils: conceptual and operational ideologies.

In line with this, considering all the numerical and descriptive results from the participants and conclusions, the researchers humbly suggested creating a scientific comic strips magazine per quarter, improving the Scientific Comic (SciCom) Strips Magazine by making it to be a digital cartooning that can be utilized by the pupils using their cellphone or other devices, and the concept of Comic strips Magazine can be assimilated and applied in other core subjects.

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