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SUPPORT INSTRUCTIONAL MATERIALS IN SCIENCE FOR GRADE 4 LEARNERS

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Abstract :

This study assessed the level of performance in Science of the Grade 4 learners of Daldalayap Elementary School, San Clemente District, Tarlac Province during the school year 2023-2024 through the quantitative-descriptive research design. The quantitative-descriptive research design was employed to determine the level of performance in Science of the Grade 4 learners based on their final rating for school year 2023-2024. It was also utilized to look into the weaknesses in Science of the Grade 4 learners. Based on the findings, support instructional materials were proposed to enhance the level of performance in Science of the Grade 4 learners. The developed support instructional materials were evaluated by experts as to their acceptability in terms of content, quality of presentation and physical make-up. The sources of data in this study were the Science teachers in Daldalayap Elementary School who provided data to answer the sub-problems raised in the study with 16 Grade 4 learners as subjects of the study. Frequency, percentage and weighted mean were utilized to treat the data statistically.

Summary of Findings: 1.0 Level of Academic Performance in Science of the Grade 4 Learners There were 3 or 18.75 % of the learners who obtained "advanced" level of performance or rating of 90-100%. There were 5 or 31.25% of the learners who obtained 85-89% rating described as "proficient" level of performance. There were 7 or 43.75% learners with 80-84% rating described as "approaching proficiency" performance. There was 1 learner or 6.25% with 75-79% rating described as developing performance. No learners obtained rating of below 75% described as "beginning" performance. 2.0 Weaknesses in Science of the Grade 4 Learners The weaknesses in Science of the Grade 4 learners are the following: Changes in the position of the sun with the length of shadows; Other weather instruments used to measure different weather components; Effects of the sun to human activities; The water cycle; Water from different sources in the context of daily activities; Characteristics of different types of soil; Effects of force when applied to an object; Changes in solid materials when hammered and cut; Changes in solid materials when pressed; and Materials that undergo decay. 3.0 Support Instructional Materials in Science for Grade 4 Learners Support instructional materials in Science for Grade 4 learners were proposed to improve their level of academic performance. 4.0 Acceptability of the Support Instructional Materials In Science for Grade 4 Learners In terms of content, 4 of the 5 criteria had WM of 4.00 and 1 with WM of 3.50 for descriptive equivalent of "very acceptable." In terms of quality of presentation, 2 of the 3 criteria had WM of 3.50 and 1 with WM of 4.00 for descriptive equivalent of "very acceptable." In terms of physical make-up, 2 of the 3 criteria had WM of 3.50 and 1 with WM of 4.00 for descriptive equivalent of "very acceptable". The overall average weighted mean was 3.75 for descriptive equivalent of "very acceptable".

Based on the findings of the study, the following conclusions were drawn: 1. Most of the Grade 4 learners are approaching proficiency in Science which indicates that they have done average work and have a good grasp of scientific concepts and acquisition of skills in Science. 2. The weaknesses in Science of the Grade 4 learners are changes in the position of the sun with the length of shadows, other weather instruments used to measure different weather components and effects of the sun to human activities. 3. Support instructional materials in Science were proposed for the Grade 4 learners to enhance their level of academic performance. 4. The proposed support instructional materials in Science are very acceptable based on the evaluation of experts.

On the basis of the findings and conclusions drawn, the following recommendations were offered: 1. The proposed support instructional materials should be considered for use by school authorities concerned to enhance the level of academic performance of Grade 4 learners. 2. The developed support instructional materials should be tried out on a bigger scale for further improvement of the materials. 3. Teachers should be encouraged to develop instructional materials particularly on subject/ topics where most students encounter difficulties. 4. The school administration should provide support in the production of instructional materials developed by teachers. 5. Other researchers may conduct similar studies on a wider scope to validate the findings of the study.

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Keywords: instructional materials, Grade 4 learners

INTRODUCTION

Education is the most essential tool for everyone to become successful in life. It encourages everyone to step forward and excel in creating positive effects where recognition and achievement can be acquired. It provides everyone the ability to think

critically in both ways, to get a better decision in order to cope and handle different life challenges and generates motivation for everyone to have better prospects needed to grow on their own chosen path in life (Dizon, et.al., 2019).

Science education has been part and parcel of the curricular programs of basic up to higher education. The Science curriculum distinguishes the role of science and technology in daily human activities. Sunga and Hermosisima (2018) claimed that science education is an important key to succeed in today's global knowledge environment profoundly shaped by Science and Technology. Improving Science literacy among learners is the aim of science education. It equips learners the necessary knowledge and life skills for them to be able to make intelligent decisions and judgments in real-life experiences. Its basic scientific concepts are foundations of individual's success and societal development. Scientific process skills are requisite for successful learning in Science because these skills build strong foundation for effective application of scientific method to daily life. It is important that learners develop these skills not only for attaining good standing in Science class but for a heavier reason of maximizing learning, making effective decisions and solving real-life problems (Mingoa, 2021).

Science teaching involves teaching students to use their knowledge, beliefs and metacognitive and effective thought processes to generate new, fruitful, and transferable conceptions that have personal and everyday meaning and significance. As a result, effective science teaching leaves students with the ability and the motivation to solve problems scientifically and to carry out scientific investigation. Hence, effective instructional strategies involve knowledge of multiple methods or activities sequences that lead to successful student learning and a specific concept or process skill (Rogayan and Dollete, 2019).

Learning and teaching methods, curriculum and assessment are all highly influential in the formation of student attitudes towards science, as is the quality of the teaching that they experience. Science is unique among school subjects in that its curriculum aims to create future scientists rather than the future citizen.

As educators, there is a need to reflect on the demands of life in the 21st century and question both how to best help the children to become scientifically literate and how to teach for scientific literacy within the classrooms. It is the responsibility of scientists and educators to provide everyone with background knowledge to help cope with the fast-paced changes of today and tomorrow.

In order to do so, the society should join the mainstream in the application of science and technology through appropriate instruction. This requires all teachers of Science throughout the world to be very adept and knowledgeable in the subject particularly in the concepts, principles and methods of what is considered scientifically relevant in the contemporary times.

Science holds one of the dominating places in the elementary curriculum. This is so because every sector recognizes an increasing contribution of it to the progress of the modern world as well as its traditional standing as an element of humanistic and scientific education. Its importance, as one of the core learning areas is a common knowledge. Science, likewise, has been recognized as a patent means of sharpening its competitive edge.

Science curriculum is learner-centered and inquiry-based, emphasizing the use of evidence in constructing explanations. Concepts and skills in Life Sciences, Physics, Chemistry, and Earth Sciences are presented with increasing levels of complexity from one grade level to another in spiral progression, thus paving the way to a deeper understanding of core concepts. The integration across science topics and other disciplines will lead to a meaningful understanding of concepts and its application to real life situations (K to 12 Science Curriculum Guide, 2013).

Science content and science processes are intertwined in the K to 12 Curriculum. Without the content, learners will have difficulty utilizing science process skills since these processes are best learned in context. Organizing the curriculum around situations and problems that challenge and arouse learners' curiosity motivates them to learn and appreciate science as relevant and useful. Rather than relying solely on textbooks, varied hands-on, minds-on, and hearts-on activities will be used to develop learners' interest and let them become active learners.

In order to nurture or develop globally competitive learners and produce a 21st century learner, science has been the keystone to quality education. Science is an active subject that demands that hands-on and mind-on experiences that challenge pupils' initiatives are encouraged. Teaching methods that promote understanding and thinking with emphasis on scientific processes should be employed and the rote learning of scientific facts de-emphasized. Also, there is a need for science teachers to take the abstract notion out of science by using real-to-life, simple and down-to-earth instructional materials which can be resourced from the environment.

Varied instructional materials and manipulative activities must be used by the Science teacher. According to Lacson (2015), instructional materials are the tools teachers use to teach their learners. Excellent instructional materials have a big impact on learning since students learn most by doing. Engaging in hands-on activities gives the pupils idea on how this experience can be applied in a real life situation.

These instructional materials serve as aid for instruction. Through this, the teacher will be able to make his strategies in teaching more effective and meaningful. It is much easier also for pupils to learn and understand their lesson as well as acquire the skills necessary in the field. Further, the adequacies of instructional materials that will support the pupils' effective learning also have its own demand in the educational system.

On the other hand, there had been existing problems that caused the low achievement of learners. Problems of learners can be attributed to the learning environment (Imam, 2014). This may include the teacher's competencies, curriculum, availability of instructional materials, facilities and other contributing factors in the school. Learning materials such as books and Science equipment are either unavailable or inadequate in many schools. Also, very few schools have Science laboratories.

Concern also has been expressed that teachers' manuals and guides, intended to help teachers' teach more effectively, are inadequate. Teaching Science effectively is a different but rewarding work. The difficulty stems from two sources. First, students in most science classes bring a wide range of prior knowledge, experiences, reasoning, and internets. Second, teachers must integrate the core body of scientific knowledge and scientific inquiry in a way that does justice to both the aspects of Science and their integration.

The Science teachers in Daldalayap Elementary School are confronted by problems in their teaching of Science, particularly the lack of teaching aids and instructional materials. There is still much to be done in Science to play a dynamic role in building the nation. One is tackling this problem.

It is in this light that the researcher developed support instructional materials in Science for Grade 4 learners to address the problems of teachers in Daldalayap Elementary School, San Clemente District, Tarlac Province during the school year 2023-2024.

Statement of the Problem

This study assessed the level of performance in Science of the Grade 4 learners of Daldalayap Elementary School, San Clemente District, Tarlac Province during the school year 2023-2024. Findings of the study served as bases in developing support instructional materials in Science for Grade 4.

Specifically, it sought to answer the following sub-problems:

1. What is the level of performance in Science of the Grade 4 learners?
2. What are the weaknesses in Science of the Grade 4 learners?
3. What support instructional materials may be proposed to enhance the level of performance in Science of the Grade 4 learners?
4. How acceptable are the proposed support instructional materials in Science for the Grade 4 learners based on the evaluation of experts?

METHODOLOGY

This chapter describes the methods and procedures adapted in the conduct of the study which includes the research design, sources of data, instrumentation and data collection, and tools for data analysis.

Research Design

This study assessed the level of performance in Science of the Grade 4 learners of Daldalayap Elementary School, San Clemente District, Tarlac Province during the school year 2023-2024 through the quantitative-descriptive research design.

The quantitative-descriptive research design was employed to determine the level of performance in Science of the Grade 4 learners based on their final rating for school year 2023-2024. It was also utilized to look into the weaknesses in Science of the Grade 4 learners. Based on the findings, support instructional materials were proposed to enhance the level of performance in Science of the Grade 4 learners. The developed support instructional materials were evaluated by experts as to their acceptability in terms of content, quality of presentation and physical make-up.

Sources of Data

The sources of data in this study were the Science teachers in Daldalayap Elementary School who provided data to answer the sub-problems raised in the study with 16 Grade 4 learners as subjects of the study.

Instrumentation and Data Collection

To gather the data needed in this study, the researcher used the final rating in Science of the Grade 4 learners during the school year 2023-2024 to determine their level of performance. The Grade 4 learners' weaknesses in Science were also determined based on the results of teacher-made tests. Based on the data gathered, support instructional materials were proposed to enhance the level of performance in Science of the Grade 4 learners.

The developed support instructional materials were evaluated by experts as to their acceptability. The questionnaire for acceptability was adopted from Espinar (2017).

Tools for Data Analysis

Weighted mean was utilized to treat the data statistically.

The formula is:

$$WM = \frac{\Sigma fx}{N}$$

Where:

WM = Weighted Mean

Σfx = the sum of the products per column

N = the number of respondents

To interpret the data, the following reference was used:

Point Values	Statistical Limits	Descriptive Equivalent (DE)
5	4.50-5.00	Highly Acceptable (HA)
4	3.50-4.49	Very Acceptable (VA)
3	2.50-3.49	Moderately Acceptable (MA)
2	1.50-2.49	Slightly Acceptable (SA)
1	1.00-1.49	Not Acceptable (NA)

RESULTS AND DISCUSSION

This section presents the data gathered and their analysis and interpretation to answer the sub-problems raised in the study.

Level of Performance in Science of the Grade 4 Learners

This section presents the level of academic performance in Science of the Grade 4 learners in Daldalayap Elementary School, San Clemente District, Tarlac province during the school year 2023-2024 based on their final ratings to answer sub-problem number 1. Table 1 presents the academic performance in Science of the Grade 4 learners in Daldalayap Elementary School

TABLE 1
Level of Performance in Science of the Grade 4 Learners

Performance Rating	***f***	**%**
Advanced (90-100%)	3	18.75
Proficient (85-89%)	5	31.25
Approaching Proficiency (80-84%)	7	43.75
Developing (75-79%)	1	6.25
Beginning (Below 75%)	0	0
TOTAL	**16**	**100%**

As presented in Table 1, there were 3 or 18.75% Grade 4 learners who obtained "advanced" level of performance in Science or ratings of 90 – 100%. This means that the Grade 4 learners had a very high degree of understanding and acquisition of Science concepts and skills. There were 5 or 31.25% who are "proficient" in Science or ratings of 85-89% which indicates a high degree of understanding and acquisition of concepts and skills in Science. There were 7 or 43.75% of the learners with 80-84% rating described as "approaching proficiency" which indicates a good grasp of Science concepts and skills. One learner or 6.25% had "developing" level of performance with 75-79% ratings and indicate weak understanding and acquisition of Science concepts and skills. None of the Grade 4 learners were considered as "beginning" with below 75% rating which indicates little understanding of the concepts and skills.

These results imply the need to develop instructional materials in Science in the form of worksheets for the Grade 4 learners to enhance their level of performance in the subject for instructional materials play an important role in teaching and learning. They can be used to support and supplement the content of a lesson, help the pupils learn new concepts, and provide practice opportunities. They are essential since they help the teacher and learners avoid overemphasis on recitation and rote learning that can easily dominate a lesson. They allow learners to have practical experiences which help them to develop skills and concepts.

Weaknesses in Science of the Grade 4 Learners

Weaknesses in Science, as used in the study, refer to the identified difficulties in Science of the Grade 4 learners. These are the least mastered competencies based on the number or percentages of learners answering the items incorrectly and based on the report of teachers.

This section presents the weaknesses in Science of the Grade 4 learners in Daldalayap Elementary School during school year 2023 – 2024 to answer sub-problem number 2. Table 2 presents the data.

TABLE 2
Weaknesses in Science of the Grade 4 Learners

Competencies / Skills	**% of learners who answered incorrectly**
• Changes in the position of the sun with the length of shadows	72.20
• Other weather instruments used to measure different weather components	70.34
• Effects of the sun to human activities	69.62
• The water cycle	68.84
• Water from different sources in the context of daily activities	57.78
• Characteristics of different types of soil	51.10
• Effects of force when applied to an object	45.56
• Changes in solid materials when hammered and cut	42.30
• Changes in solid materials when they are pressed	36.20
• Materials that undergo decay	32.44

The weaknesses in Science of the Grade 4 learners were based on the number or percentage of learners who answered incorrectly the items in the teacher-made tests. As presented in Table 2, the item with the highest percentage with incorrect answers was changes in the position of the sun with the length of shadows where 72.20% of the learners answered incorrectly, followed by other weather instruments used to measure different weather components with 70.34% incorrectly answered. Third on the list was effects of the sun to human activities with 69.62% of learners who answered incorrectly. The least percentages of learners who answered incorrectly include materials that undergo decay (32.44%), changes in solid materials when they are pressed (36.20%) and changes in solid materials when hammered and cut (42.30%).

These results imply that most of the Grade 4 learners find Science to be a difficult subject. It is important then to identify their difficulties early on and address them by way of developing instructional materials to improve their academic performance in Science.

Support Instructional Materials in Science for Grade 4 Learners

Support instructional materials in Science for Grade 4 learners in Daldalayap Elementary School, San Clemente District, Tarlac Province were proposed to answer sub-problem number 3. The support instructional materials were based on the weaknesses in Science of the Grade 4 learners.

Acceptability of the Support Instructional Materials in Science for Grade 4 Learners

This section is concerned with the acceptability of the proposed support instructional materials in Science for Grade 4 learners based on the criteria adopted from Espinar (2017). Table 3 presents the data.

TABLE 3
Acceptability of the Support Instructional Materials In Science for Grade 4 Learners

CRITERIA	WM	DE
A. Content		
1. The vocabulary terms and content are suitable to the level of Grade 4 learners.	4.00	VA
2. The exercises are arranged in the order familiar to Grade 4 learners.	3.50	VA
3. The instructions are clear and easy to follow.	4.00	VA
4. The concepts are within the Grade 4 learners' level of experience.	4.00	VA
5. The number of exercises is limited so as not to overload or confuse the learners.	4.00	VA
Average WM	3.90	VA
B. Quality of Presentation		
1. The illustrations are clear and interesting.	3.50	VA
2. The lay-out of the materials can elicit children's attention.		
3. The materials are simple and possess imaginative quality.	3.50	VA
	4.00	VA
Average WM	3.67	VA
C. Physical Make-up		
1. The instructional design of individual tasks is carefully planned.	3.50	VA
2. The size of the type and print is proper for the age level of Grade 4 learners.	4.00	VA
3. The lay-out of the pages has combined attractiveness with utility.	3.50	VA
Average WM	3.67	VA
Overall Average WM	**3.75**	**VA**

Legend: *WM = Weighted Mean*

Relative Values	Statistical Limit	Descriptive Equivalent (DE)
5	4.50-5.00	Highly Acceptable (HA)
4	3.50-4.49	Very Acceptable (VA)
3	2.50-3.49	Moderately Acceptable (MA)
2	1.50-2.49	Slightly Acceptable (SA)
1	1.00-1.49	Not Acceptable (NA)

The results of the perceptions of the Grade 4 teachers show that in terms of content, the proposed support instructional materials are "very acceptable" as evidenced by the weighted mean ranging from 3.50 – 4.00 and by the average of such which is 3.90. These have something to do with the suitability of the vocabulary terms and content to the level of Grade 4 learners (WM=4.00); the familiarity of the Grade 4 learners on the arrangement of the exercises (WM=3.50); the clarity of the instructions being easy to follow (WM=4.00); the concepts being within the Grade 4 learners' level of experience (WM=4.00); and limitation of the number of exercises so as not to overload or confuse the learners (WM=4.00). The results imply that the proposed support instructional materials can cater to the needs of the Grade 4 learners in terms of content.

On the quality of the presentation, the average weighted mean is 3.67 which means "very acceptable". This particular criterion includes the illustrations being clear and interesting (WM=3.50); the layout of the materials can elicit children's attention (WM=3.50); and capability of the materials and their possessions of imaginative quality (WM=4.00). Thus, the results imply that the proposed worksheets meet the criteria for quality of presentation.

As to physical make-up, the average weighted mean is 3.67 for a descriptive equivalent of "very acceptable." This includes careful planning of the instructional design of individual tasks (WM=3.50); proper size of the type and print for the age level of Grade 4 learners (WM=4.00); and combined attractiveness with utility of the layout of the pages (WM=3.50).

Overall, the average weighted mean is 3.75 which means that the proposed worksheets are "very acceptable" as perceived by the Grade 4 teachers.

Based on the results, the developed support instructional materials are accepted by the Science teachers. This implies that the materials could be used as a tool in enhancing the Grade 4 learners' performance in Science.

SUMMARY

This study assessed the level of performance in Science of the Grade 4 learners of Daldalayap Elementary School, San Clemente District, Tarlac Province during the school year 2023-2024 through the quantitative-descriptive research design.

The quantitative-descriptive research design was employed to determine the level of performance in Science of the Grade 4 learners based on their final rating for school year 2023-2024. It was also utilized to look into the weaknesses in Science of the Grade 4 learners. Based on the findings, support instructional materials were proposed to enhance the level of performance in

Science of the Grade 4 learners. The developed support instructional materials were evaluated by experts as to their acceptability in terms of content, quality of presentation and physical make-up.

The sources of data in this study were the Science teachers in Daldalayap Elementary School who provided data to answer the sub-problems raised in the study with 16 Grade 4 learners as subjects of the study.

Frequency, percentage and weighted mean were utilized to treat the data statistically.

Summary of Findings:

1.0 Level of Academic Performance in Science of the Grade 4 Learners

1.1 There were 3 or 18.75 % of the learners who obtained "advanced" level of performance or rating of 90-100%.

1.2 There were 5 or 31.25% of the learners who obtained 85-89% rating described as "proficient" level of performance.

1.3 There were 7 or 43.75% learners with 80-84% rating described as "approaching proficiency" performance.

1.4 There was 1 learner or 6.25% with 75-79% rating described as developing performance.

1.5 No learners obtained rating of below 75% described as "beginning" performance.

2. 0 Weaknesses in Science of the Grade 4 Learners

The weaknesses in Science of the Grade 4 learners are the following:

2.1 Changes in the position of the sun with the length of shadows;
2.2 Other weather instruments used to measure different weather components;
2.3 Effects of the sun to human activities;
2.4 The water cycle;
2.5 Water from different sources in the context of daily activities;
2.6 Characteristics of different types of soil;
2.7 Effects of force when applied to an object;
2.8 Changes in solid materials when hammered and cut;
2.9 Changes in solid materials when pressed; and
2.10 Materials that undergo decay.

3.0 Support Instructional Materials in Science for Grade 4 Learners

Support instructional materials in Science for Grade 4 learners were proposed to improve their level of academic performance.

4.0 Acceptability of the Support Instructional Materials In Science for Grade 4 Learners

4.1 In terms of content, 4 of the 5 criteria had WM of 4.00 and 1 with WM of 3.50 for descriptive equivalent of "very acceptable."

4.2 In terms of quality of presentation, 2 of the 3 criteria had WM of 3.50 and 1 with WM of 4.00 for descriptive equivalent of "very acceptable."

4.3 In terms of physical make-up, 2 of the 3 criteria had WM of 3.50 and 1 with WM of 4.00 for descriptive equivalent of "very acceptable".

4.4 The overall average weighted mean was 3.75 for descriptive equivalent of "very acceptable".

CONCLUSIONS

Based on the findings of the study, the following conclusions were drawn:

1. Most of the Grade 4 learners are approaching proficiency in Science which indicates that they have done average work and have a good grasp of scientific concepts and acquisition of skills in Science.
2. The weaknesses in Science of the Grade 4 learners are changes in the position of the sun with the length of shadows, other weather instruments used to measure different weather components and effects of the sun to human activities.
3. Support instructional materials in Science were proposed for the Grade 4 learners to enhance their level of academic performance.
4. The proposed support instructional materials in Science are very acceptable based on the evaluation of experts.

RECOMMENDATIONS

On the basis of the findings and conclusions drawn, the following recommendations were offered:

1. The proposed support instructional materials should be considered for use by school authorities concerned to enhance the level of academic performance of Grade 4 learners.
2. The developed support instructional materials should be tried out on a bigger scale for further improvement of the materials.
3. Teachers should be encouraged to develop instructional materials particularly on subject/ topics where most students encounter difficulties.
4. The school administration should provide support in the production of instructional materials developed by teachers.
5. Other researchers may conduct similar studies on a wider scope to validate the findings of the study.

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