

Content Area Reading-Based Strategic Intervention Materials (CARB-SIMs) in Science VI

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Abstract This study was conducted to develop content area reading-based strategic intervention materials (CARB-SIMs) in Science VI, their selection of skills and topics based on the results of five-year Science quarterly examinations scores revealing the students' least mastered skills. Utilizing a descriptive-developmental research, the study reached six phases: designing, developing, validating, evaluating, and revising. The Department of Education modified checklist used by teacher-evaluators assessed the CARB-SIMs. The weighted mean analyzed the results of the evaluation on the developed CARB-SIMs, using an adopted and modified SIM evaluation based on teacher evaluation and pupil perception. Evaluators strongly agreed that the developed SIM followed the guidelines and criteria in constructing strategic intervention materials. Student Perception Questionnaire of Salviejo (2014) determined how they perceive the use of the strategic intervention materials. They found the SIMs interesting, easy to use and the activities were fun to do.

Keywords: Content area reading, Instructional material, Reading skills, Science skills, Scientific literacy, Strategic intervention material

Introduction

Scientific literacy symbolizes the highest and most admirable purpose of science teaching. This is relative to the K to 12 curriculum guide in science where science education aims to develop scientific literacy among students enough to prepare them to be participative citizens, who are able to make judgments and decisions in applying scientific knowledge that may have social, health, or environmental impacts. Students should have a deep understanding of the content knowledge in Science which may help them become scientifically-, technologically-, environmentally- literate and productive member of the society, as the K to 12 Science curriculum envisions.

Unfortunately, some teachers have always prepared lectures in teaching science. Laboratory activities are excluded resulting in inadequate skills of pupils in experimenting. A series of homework from specific topics are also emphasized where students have engaged in searching answers from the book. This teaching method contradicts the aim of science education which seeks to provide a scientifically literate person steeped with knowledge and ideas necessary for development of oneself and of the country.

Educators are still in constant search for an instructional strategy that helps the students to preserve vital ideas and concepts in science as well as upgrade their knowledge through an inquiry approach in science contents. Staver (2007) stresses that learning environment affects the students' construction of their ideas and knowledge in science which may support the active learning of the content.

Since schools are considered the primary learning environments, the teaching therefore, must facilitate the construction of core knowledge among pupils. In addition, teaching strategies that help the students discover new, relevant ideas and concepts in science must be utilized further to improve their construction of knowledge.

Based on the researcher's observations, teaching of science has been handicapped by the lack of effective instructional materials. Mostly, teachers rely on textbooks to facilitate the learning of concepts in science. Concrete materials in science also give students opportunity to learn based on first hand experiences other than abstract concepts.

Students' comprehension skills remain to be problematic in science learning for they cannot grasp the text easily, especially in different specific content areas in Science. This calls for an emphasis on comprehension skills in science instruction since additional contents are included. Equally, it is necessary to implement an integration of one skill into the content area, to make them more relevant and interconnected. Actually, more can be taught in a given period of time than when done separately. Such an approach becomes useful in reading, as it involves many skills; although these skills need a meaningful context to a content area (Bowers, 2000).

The Reading Association of the Philippines (RAP), as cited in Flores (2007), associated the difficulties encountered by students in Science with reading, specifically for these reasons: students' lack of proficiency in the language of instruction; limited vocabulary; poor in seeing relationship of ideas; poor in making comparisons and contrasts; students' inability to draw conclusions or grasp organizational patterns of a text; and varying reading abilities.

The instructional materials needed at present are the strategic intervention materials used for remediation for

students who do not master the concepts in Science. Soberano (2009) emphasizes that Strategic Intervention Materials (SIMs) are so designed to help teachers provide the students the much-needed support to make progress. These materials try to increase and deepen the pupils' skills and knowledge of concepts.

Reading is an important key in understanding different concepts in Science. Skills in Science cannot be attained without the pupil's ability to comprehend the information written in the text. Besides, teachers need to integrate reading skills in their lesson to help the learners not only to understand the information but also to interpret and evaluate it. The difference of the strategic intervention materials to other instructional materials is that the SIM focuses on the skills not mastered by the students during the regular class and it is intended for remediation.

The researcher pursued the development of SIM for content area reading in Science VI to address the least mastered skills using the competencies in Science as contents and the reading skills as enabling skill in learning these concepts.

Literature Review

On Science Teaching

Based on Jerome Bruner's theory of learning which states that learners construct new ideas or concepts based on existing knowledge, the study focuses on learning as an active process. Facets of the process include selection and transformation of information, decision making, generating hypotheses, and making meaning from information and experiences. In fact, students understand the same concept in different ways, their understanding and the ways they construct meaning are rooted in situational contexts. What

makes meaning for children is not simply what words are used but how the explanation is accepted within their wider narrative context: the links that are made to events and memories and the personal values that color and shape understandings (Tytler & Peterson, 2004a & 2004b).

Content Area Reading in Science

A constructivist perspective on learning in science suggests that learners can only make sense of new situations in terms of their existing understanding. Long-term constructivist-oriented instruction helps both high and low achieving students develop comprehensive and integrated cognitive structures, engages them in metacognition, and helps them to use their information processing strategies effectively (Wu & Tsai, 2005).

On the other hand, Ruddell (2008) stressed that reading is also constructivist in nature with its emphasis on the individual as creator rather than receiver of meaning. Just as importantly, this view of reading process has instructional implications; that is, from this theoretical vantage point, one sees many opportunities for teachers to teach in ways that will increase students' reading abilities. Reading is the act of constructing meaning while transacting with text. The reader makes meaning by fusing prior knowledge and previous experience; and by seeking information available in text and immediately remembered or anticipated social interaction, and communication. Furthermore, Johnson and Hansen (2009) stressed that concepts being taught in science often rely on students' reading to build background knowledge or to follow inquiry procedures. Science teachers need to know strategies they can implement to aid students' comprehension of the specific concepts they teach. Dahar (2011), in investigating the effect of availability of instructional materials on the academic performance of

students in Punjab (Pakistan), cited that instructional materials play a very important role in the teaching - learning process. Results revealed that availability of instructional materials has a strong relationship with academic performance of the students.

Preparing Instructional Materials in Science

Experts in science education have listed content (subject matter) and instructional practices as the two priority areas for initial improvement (McCleery and Tindal, 1999). They have proposed three components of science literacy: knowledge of concepts within content discipline areas; application of science process skills; and the use of high-level reasoning within instructions.

Castillo (2009) summarized all the characteristics of a better instructional material considering the following guidelines: 1) It should be in line with the objectives to be attained; 2) It needs to be clear and understandable to the reader; 3) It must contain specific relevant materials; 4) Objectives and instructions must be simply stated; 5) It should be accurate, scientifically sound, factual, and current; 6) It must be timely; 7) It must be adequate and suitable to target learners; and 8) To be effective, it must produce the desired outputs.

Moreover, May-as (2005) emphasized that the instructional materials developed provide content which are suitable, effective, and one which caters to different learning styles and preferences, promoting cooperative learning, as perceived by the teacher experts who tried out the materials and the number of students using the materials.

On Strategic Intervention Material (SIM)

SIM is an instructional material prescribed by the Department of Education to improve students' performance in science subjects. To promote successful learning in the field of science and technology subjects in both elementary and secondary among public schools, DepEd Memorandum No. 117, series of 2005 provides teachers the trainings and workshops on how to prepare this intervention material.

Bunagan (2012) defines Strategic Intervention Material as the means to re-teach the concepts and/or least mastered skills. It is a material given to students to help them master competency-based skills undeveloped during a regular classroom teaching. It consists of both learning strategies (for students) and content enhancement (for teachers).

Guilot (2000) stresses that the prototype instructional materials based on Effective Reading Instruction in the Content Area (ERICA) Model developed in her study can aid the teacher in helping and teaching students become effective readers in the different disciplines. Moreover, the developed prototype materials based on ERICA strategies are promising instruments for attaining reading-to-learn objectives. The materials appear suitable, acceptable, and effective, as evaluated by a number of teacher-experts and students. Also, reading materials in the content areas call for a specialized knowledge on how to unlock information from the texts, which is what teachers do as students undergo series of exercises to develop reading strategies until such time that the use of these materials becomes automatic and self-imposed whenever needed.

Framework of the Study

Science teaching includes science skills and concepts needed to acquire scientific literacy. By contrast, reading skills can facilitate the learning of science skills and concepts. These may be used in developing the skills necessary for the content area reading in science. The concepts and skills in Science can also facilitate the development of the skills in reading making the study focused on the content area reading in science where science concepts serve as content and the reading skills as enabling skills.

Constructivists maintain that learners need to be empowered and to have control over the learning process. According to Bretz (2001), Novak's Theory of Human Constructivism states that "a meaningful learning underlies the constructive integration of thinking, feeling, and acting, leading to human empowerment for commitment and responsibility." Meaningful learning will only occur when education provides experiences that require students to connect knowledge across the three domains either cognitive, affective, or psychomotor.

The four CARB-SIMs comprise of eight parts:

- ***Title Card***

As the first card in the four sets of SIM, it shows the title of the SIM as well as images that depict the concept in Science. A cover title placed outside the package presents the concepts in Science with corresponding reading skills to be learned.

- ***Guide Card***

The guide card lists the concepts and skills to be learned in Science and Reading. This is the second

card with six frames showing a conversation of two fiction characters about the science concept.

- ***Instruction Card***

The instruction card, the third card, teaches the reading skills explicitly in relation to the science concepts and process and makes the developed SIMs different from other SIMs. Here, reading skills are explained, described, exemplified, and modelled while checking for pupils' understanding through questioning.

- ***Activity Cards***

The activity card, the fourth part of SIM, presents different activities related to the science and reading skills to deepen pupils' understanding of both. These activities are arranged in such a way that the level of engagement and difficulty are considered to avoid duplication and monotony in working on each.

- ***Assessment Card***

The assessment card-- the fifth component --provides exercises or drills in the form of multiple-choice type test, true or false, and other activities that assess pupils' understanding on science concepts and reading skills.

- ***Enrichment Card***

The enrichment card, as constructed in the SIM, provides activities that summarize what the pupils have learned in the previous activities. It

also involves new opportunities for the pupils to apply the skills in reading and concepts in Science in new contexts, helping them to form generalizations.

- ***Answer Card***

The answer card-- the seventh part --provides the keys to corrections for activity cards, assessment card, and enrichment card.

- ***Reference Card***

Finally, the reference card lists down the textbooks and internet sites used in the materials, as well as additional reading to give the pupils new information about the concept.

The diagram below illustrates the conceptual framework of the study.

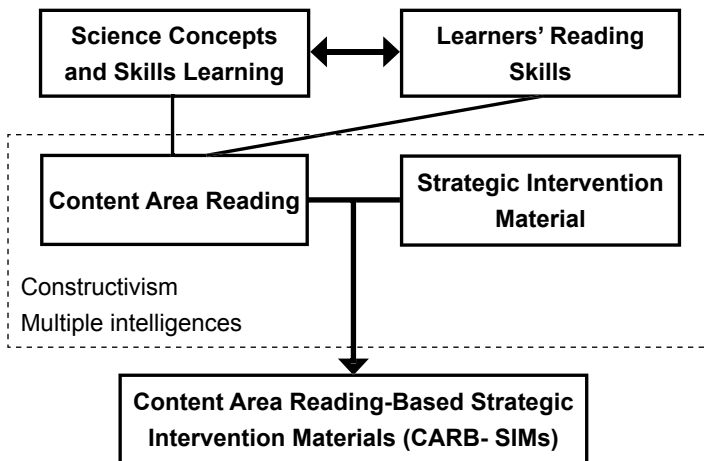


Figure 1. Conceptual Framework of the Study

As shown in the diagram, the learning of concepts and skills is assumed to be influenced by the reading skills of the learners even as these are also needed for processing science concepts and skills, as reflected by the bidirectional arrow between the two. Hence, these two integrated elements represent the components in content area reading in science.

Multiple intelligences theory, in contrast, recognizes the unique nature of each individual student. Developing lessons based on this theory requires that the teacher blends a personal instructional style with the students' multiple intelligences profiles present in any given class. Undeniably, some teachers, interested merely in incorporating multiple intelligences theory into their instruction, have some uncertainty of whether they have to revise their objectives, or how they could decide on which intelligences to use in their lesson, or whether they have to incorporate all the intelligences into a lesson (Mckenzie, 2005). Multiple intelligence theory serves as the basis on determining student's potential in dealing with skills in reading and science to suit their learning styles.

Science process skills and reading skills are the same competencies that help the pupils classify, evaluate, generalize, and identify ideas. Reading in the content area, especially in science, is an important process where students gain understanding and teachers use a variety of strategies to address science content in depth. The instructional materials in the content area are learning devices, not just source of information. The content area reading when integrated in developing strategic intervention materials will come up with a model called the Content Area Reading-Based Strategic Intervention Materials (CARB-SIM) in Science VI.

Barton M.L. & Jordan D. L. (2001) hold that in addition to the general reading skills needed to comprehend narrative text, readers of science text also must be able to apply

the following knowledge and skills: understand specialized vocabulary terms and phrases unique to science, grasp the nuances of vocabulary terms and phrases. Of particular concern, then, are reports that students' motivation to learn wanes over time. Besides connecting reading assignments to students' real world experiences, teachers need to show students that becoming effective consumers of science text has value. They have to see firsthand that practicing the right reading strategies will improve their academic achievement, that is especially true of struggling readers. Some of these students also have a poor attitude toward reading and often do not see the connection between the effort they put forth to read and complete their assignments and the grades earned in class.

Bowers (2000) holds that Science and Reading complement each other well because of the similarities between reading skills and science process skills. The fusion of skills in both subject areas makes them natural partners for integration. For some skills, such as identifying main ideas and details and classifying, different terms are used to describe the same process.

Purpose of the Research Study

Mainly, this study seeks to develop content area reading-based strategic intervention materials (CARB-SIM) in Science for Grade VI pupils at Silvestre Lazaro Elementary School, Division of City Schools-Valenzuela. Specifically, it aims to:

1. identify the least mastered skills and match these with appropriate reading skills;
2. develop the desired strategic intervention materials;
3. validate and try-out the developed strategic intervention materials;

4. finalize the content-area reading based strategic intervention materials; and
5. determine the inter-rater agreement between the evaluators of the developed SIMs.

Methodology

In using the descriptive-developmental method of research, the study explained the process of developing strategic intervention materials in Science VI with the integration of selected reading skills.

Participants of the Study

Participants in the study involved the instrument validators, expert evaluators and the pupils who tried out the SIMs.

Instrument Validators

Ten teachers all competent SIM developers, validated the two instruments used in the study. They rated the acceptability of the instruments using the Department of Education checklist.

Expert Evaluators

Eight evaluators were chosen based on the knowledge of the researcher about their expertise in evaluating the developed strategic intervention materials. The criteria in selecting the evaluators included their educational background (with M.A. units, Doctoral units, Master's degree holder, Doctorate holder; years in service (5 years and above); field of expertise (consultant, coordinator, Science subject teacher, English subject teacher); and experiences in instructional materials development.

The respondents from the Division of Valenzuela evaluated the developed strategic intervention materials were as follows: a) two Education Program Supervisors; b) two School Heads; c) two Master Teachers; and d) two Teachers.

Grade VI Pupils

Thirty (30) pupils tried out the developed CARB-SIMs, after which they rated them based on their perception on the following elements: language, content, organization, and objectives.

The researcher determined the samples using the purposive sampling technique by teacher nomination. In this technique, the respondents chosen were the ones attending the remedial program for which the SIMs was developed. From the 12 sections of Grade VI at Silvestre Lázaro Elementary School, thirty pupils were selected and exposed to the use of the strategic intervention materials, their age ranging from 11 to 12, sixteen girls and 14 boys.

Research Instruments

Teachers who evaluated the SIM adopted the instrument based on the DepEd Memorandum No.225, s. 2009, Enclosure No. 2 that includes criteria on sub-tasking, congruence, usability/functionality, and replicability. The modified instrument on the developed SIMs integrates reading skills.

Modified Student Perception Questionnaire (Salviejo, 2014)

This instrument covers the pupils' perception of on the incorporating reading skills in the material. The survey utilized scales from 1 – 4 with their equivalent remarks or descriptions and qualitative interpretations based on the weighted mean computed using the ranges: 1 – 1.75 (Strongly disagree); 1.76 – 2.5 (Disagree); 2.51 – 3.25 (Agree); and 3.26 – 4.0 (Strongly agree).

Data Collection Procedure

Phase I- Designing

The processes in this phase covered identification of least mastered skills, matching of science concepts and process with the reading skills, as contained in the K to 12 curriculum, and selection of appropriate reading passages based on the results of readability formula.

Determining the Least Mastered Skills (LMS) in Science VI

The researcher identified the least mastered skills based on the schools' division test in Science for the last five school years from year 2010 up to present. The science concepts, skills, and processes that obtained low scores in the cited exams were identified and compared against the standards used by the NETRC (National Educational Testing and Research Center) to ascertain the level of mastery of the pupils. Table 1 shows the interpretation of scores as used by NETRC.

Table 1. Mastery Level Description

Percentage of Correct Responses	Interpretation
96%-100%	Mastered
86%-95%	Closely Approximating Mastery
66%-85%	Moving Towards Mastery
35%-65%	Average Mastery
15%-34%	Low Mastery
5%-14%	Very Low Mastery
0-4%	Absolutely No Mastery

Source: NETRC, 2012

Matching of the Reading Skills

After determining the least mastered skills to be used as content, the researcher identified the reading skills using K to12 English curriculum guide. Reading skills analysis ensured that they appear appropriate in facilitating learning of the identified concepts in Science. The researcher prepared a matrix to match the reading skills and science processes.

Selecting the reading passage

Since the study was concerned with developing the reading skills, a passage in reading should also be selected. Thus, the researcher looked into passages in science books and in the online science websites. To ensure that the selected reading passages were within the reading level of the pupils, these were subjected to readability test over the internet that offers free readability test.

Phase II- Developing the CARB-SIMs

This phase shows the processes in constructing the SIMs, especially the components of each lesson. The four sets of SIMs consist of title card, guide card, activity card, assessment card, enrichment card, answer card and reference card in accordance with the guidelines set by DepEd.

Phase III- Validating, Evaluation and Finalizing the CARB-SIM

The acceptability of the two instruments was determined through validation by 10 teachers who looked into the criteria and guidelines for SIM development. Both instruments were interpreted using the following scale: 0.1-0.99 (not acceptable); 1.00-1.99 (acceptable with some revision); and 2.00-3.00 (acceptable with no revision).

The selected respondents evaluated the materials for a week, after which the instruments were collected and analyzed. In a one-hour try-out of the SIMs done each day among the selected Grade VI pupils to accomplish each SIM, after which, the perception survey was distributed to determine their perceptions about the SIMs. Considering the corrections given by the evaluators, and the perceptions of the target pupils about the SIMs, the researcher revised and wrote the final draft of the CARB-SIMs.

Data Analysis

Frequency, tally system, and table organization initiated the evaluation and analysis of the results. The analyzed least mastered skills in Science were presented into tabular form, while the framework of the SIMs was described and its parts shown.

Pupils' perception about the use of the SIM was tabulated, the frequency of respondents' responses were tallied and presented in tabular form, and the weighted mean for each statement and the overall weighted mean computed.

Results and Discussion

Analysis of the Least Mastered Skills in Science VI

Least mastered skills in Science VI during regular classroom teaching were analyzed. Table 2 shows topics, skills, and concepts in science that would serve as bases of the SIMs.

Table 2. Mastery Level of Science Concepts for Five Years (2010- 2015)

Science Skills	Topic	S.Y. 2010-2011		S.Y. 2011-2012		S.Y. 2012-2013		S.Y. 2013-2014		S.Y. 2014-2015		Average	MLD
		%	*MLD	%	MLD	%	MLD	%	MLD	%	MLD		
1. Compare the eight planets of the solar system	The Eight Planets of the Solar System	32	Low	35	Average	33	Low	31	Low	34	Low	33	Low
2. Describe the changes on the Earth's surface as a result of earthquakes	Causes and Effects of an Earthquake	31	Low	34	Low	36	Average	33	Low	30	Low	32.8	Low
3. Identify the parts of circulatory system and its function	Parts and Function of the Circulatory System	35	Average	33	Low	31	Low	33	Low	32	Low	32.8	Low
4. Trace the path of air in the respiratory system	Parts and Function Respiratory System	30	Low	31	Low	35	Average	34	Low	34	Low	33	Low

Table 2 shows the percentage of correct responses and its mastery level description in the quarterly examination for five years. As shown, science skill in comparing the eight planets of the solar system has been a least mastered skill for four years. In the S.Y.2011-2012, this skill had a mastery level description of average mastery but only 3% increase in the correct responses was evident from the S.Y. 2010-2011. For the science skill describing the changes on the Earth's surface as a result of the earthquakes, it only obtained an average of 33% correct responses evident in the periodical tests in Science for five years. An average mastery level description with 36% of correct responses was recorded in this skill during the S.Y. 2012-2013. The science skill, identifying the parts and function of the circulatory system, obtained an average of 32.8 % correct responses interpreted as low mastery. During the S.Y. 2010-2011, this skill got a 35% correct responses categorized as average mastery. An average 32.8% of correct responses recorded for the skill in tracing the path of air in the respiratory system described

and interpreted as least mastered. However, an increase of 4 % in the correct responses classified this skill as an average mastered skill during the S.Y. 2012-2013. With the analysis of the percentage of correct responses and its mastery level description, the identified science skills in Science was considered as least mastered skills recurring over the years. Although a slight increase was noted in the percentage of correct responses described these skills as average mastery for one school year, these could still be categorized as least mastered since the average percentage of correct responses matched that of low mastery level description. Furthermore, there were other least mastered science skills in science not tested in the National Achievement Test, thus, were not chosen for the SIMs.

Results of Expert Evaluation of CARB-SIMs

Expert evaluation of the developed CARB-SIMs was on DepEd Memorandum No.225, s. 2009, Enclosure No. 2 that includes criteria on sub-asking, congruence, usability/functionality, and replicability. The instrument was modified because the developed SIMs had integrated reading skills.

Soberano (2009) enumerated the five major parts of SIM: the guide card, activity card, assessment card, enrichment card, and reference card. Jorda (2012) emphasized that SIM is an instructional system designed to help teachers provide extra support for pupils struggling to make progress and for the students to succeed in their general education. It includes curricular materials revised to accommodate different learning styles to meet the needs of diverse learners and strategies related to six areas: reading, storing and remembering information, expressing information, demonstrating competence, social interaction, and content.

Moreover, Suguitan (2010) found that the proposed intervention materials were effective in tackling the students' reading difficulties. Positive comments were given by the evaluators, saying that the materials were well prepared and suited to the students' needs. The ideas presented by Suguitan relates to the study in that the proposed intervention materials were used to enhance the students' reading difficulties.

In this regard, Bacolor (2011) revealed that students who used the SIM showed increased levels of mastery in the topic introduced. Such positive response to the use of intervention materials could be attributed to the fact that the students understood the topic better. Also, the SIM was perceived acceptable by the General Science teachers and students, for a significant difference was observed in the evaluation of the two groups of respondents with regard to sub-tasking, congruence, and usability (functionality with respect to replicability).

Similarly, Togoanon's study (2011) showed that the project-based (PB)-SIM is a valid instructional material for teaching solutions and colloids; and therefore, there is a need to use the project-based SIM in the module form. The results of the evaluation by a committee composed of experts, peers and students indicated how these were very much acceptable in identifying the sub-tasking, congruence, and usability/functionality.

Table 3. Summary of the Weighted Mean on the Evaluation of the Four Sims

Criteria	Respiratory System		Circulatory System		Earth- quakes		Planets		OWM	QI
	WM	QI	WM	QI	WM	QI	WM	QI		
i. Sub-tasking	3.71	SA	3.67	SA	3.71	SA	3.71	SA	3.7	SA
ii. Congruence	3.63	SA	3.67	SA	3.63	SA	3.67	SA	3.65	SA
iii. Usability/ Functionality	3.66	SA	3.70	SA	3.71	SA	3.69	SA	3.69	SA
iv. Replicability	3.75	SA	3.71	SA	3.75	SA	3.75	SA	3.74	SA
v. Integration of Reading Skills	3.75	SA	3.71	SA	3.75	SA	3.75	SA	3.74	SA
Overall Weighted Mean	3.7	SA	3.69	SA	3.71	SA	3.71	SA	3.70	SA

Table 3 reveals the overall weighted mean of the frequency of responses on the evaluation of the four strategic intervention materials. The SIM on earthquakes and planets both got the highest overall weighted mean. Not too far from highest overall weighted mean, the SIM on respiratory system and circulatory system got an overall weighted mean of 3.7 and 3.69 respectively. Both the criteria on replicability and integration of reading skills got the highest overall weighted mean of 3.74 interpreted as strongly agree. This means that the developed materials had used the appropriate reading skills necessary in learning the science concepts. The material had also been found cost effective, handy, and easy to copy.

Next in rank is the criteria on sub-tasking with mean rating of 3.7 (strongly agree) to imply that the objectives in the materials are specific, measurable, attainable, result-oriented and competency-based (SMAR-C). The criteria on usability/functionality got an overall weighted mean of 3.69 interpreted as strongly agree. The evaluators strongly agreed that the parts of the SIM are well-developed.

Pupils' Perception on the Use of Strategic Intervention Materials

Pupils' perception on the use of the SIM was gathered through the perception survey questionnaire with 10 statements about the SIM and utilized a four - point rating scale with corresponding qualitative interpretations.

Table 4. Pupils' Perception on the Use of Strategic Intervention Materials

Criteria	Respiratory System		Circulatory System		Earthquakes		Planets		OWM	QI
	WM	QI	WM	QI	WM	QI	WM	QI		
1. The SIM helps me master the identified skills in Science and English.	3.6	SA	3.63	SA	3.57	SA	3.53	SA	3.58	SA
2. The presentation of the concepts in the SIM is clear and appropriate to my needs.	3.67	SA	3.7	SA	3.63	SA	3.77	SA	3.69	SA
3. I can easily understand the explanations provided by the SIM.	3.2	A	3.47	SA	3.13	A	3.4	SA	3.3	SA
4. I learn useful information not mentioned in the regular teaching after using the SIM.	3.73	SA	3.7	SA	3.77	SA	3.7	SA	3.73	SA
5. The time allotment is adequate for each lesson.	3.17	A	3.3	SA	3.17	A	3.13	A	3.19	A
6. Activities and tasks given in the SIM are engaging and challenging.	3.63	SA	3.53	SA	3.63	SA	3.6	SA	3.60	SA
7. I enjoy reading and doing all activities provided in the SIM.	3.73	SA	3.77	SA	3.7	SA	3.67	SA	3.72	SA

8.	I can easily understand the words used in the SIM.	3.13	A	3.4	SA	3.17	SA	3.2	A	3.23	A
9.	SIMs inspire and encourage me to learn more topics in Science 6.	3.67	SA	3.7	SA	3.7	SA	3.73	SA	3.7	SA
10.	I want to use SIM in a regular classroom teaching next time.	3.5	SA	3.13	A	3.3	SA	3.17	A	3.28	SA
Overall Weighted Mean		3.50	SA	3.53	SA	3.50	SA	3.49	SA	3.50	SA

Table 4 shows the frequency of responses of 30 pupils on their perception on using four strategic intervention materials. The fourth statement on usefulness in information in SIM yielded the highest mean score of 3.73 interpreted as strongly agree. From the average mean score in the four SIMs, the results indicated that SIMs provided useful information not mentioned in the regular teaching after using these materials, thereby, increasing the students' level of understanding as mentioned in Dy (2011).

Second in rank is statement 7 with an average weighted mean of 3.72 (strongly agree). The majority of the respondents strongly agreed that they enjoyed reading and doing all activities provided in the SIM. This finding related to Togonons' study in that (2011) the students enjoyed and had fun in doing their project output as a result of the completed PB-SIM.

Meanwhile, third among the perceptions with mean rating of 3.7 (strongly agree) was the ninth statement. The respondents had strongly agreed that they were inspired and encouraged to learn more topics in Science 6, its high rating attributed to the fact that some activities in the SIM allowed the respondents to relate to their real life experiences.

Table 5. Result of the Inter-rater Agreement

Participants	Value of K	Strength of Agreement
Expert Evaluators	0.89	Very good
Pupils	0.86	Very good

Table 5 shows the result of the inter-rater agreement between the evaluators of the developed CARB-SIMs. Expert evaluators have a very good agreement with the value of K as 0.89 from the range of (0.81 - 1.00), an indication that they strongly agreed that the developed CARB-SIMs have met the guidelines in developing a strategic intervention material. Similarly, pupils have a very good agreement with the value of K, as shown in their rating 0.86. This means that they perceived the developed CARB-SIMs as an effective tool in teaching to enhance students' performance and to improve their views about Science.

Conclusions

The integration of reading skills in the development of CARB-SIMs may facilitate the learning of science concepts in a sense that the pupils actively engage and participate in activities that connect to their real life experiences, a view anchored on constructivist view of learning. Comparably, Science as a content area matched with appropriate reading skills may aid in understanding science concepts and process skills to develop learners' interest and let them become active learners.

In the development of CARB-SIMs, science concepts may serve as content and the reading skills as enabling skills with multiple intelligences incorporated in each activity. As a result, the developed CARB-SIMs may provide information

requiring pupils to achieve the learning of both science concepts and reading skills.

Recommendations

Science teachers are encouraged to develop Content Area Reading-Based Strategic Intervention Material (CARB-SIM) for other concepts in Science. Equally, Reading teachers are goaded to use and integrate concepts of Science in reading. The CARB-SIMs can be used during remedial sessions and summer reading camps, as much as promoted during seminars and trainings for teachers. An enhanced version can be developed using other learning competencies in Science and in other subject areas following this model. Moreover, an experimental research can be done on this study to reveal the effectiveness of the CARB-SIMs between the two groups of respondents: treatment and control groups. Further studies may be made on the CARB-SIMs, with emphasis on its relative effect on the achievement, assessment and motivation of pupils.

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